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DENTAL SEPSIS IN RELATION TO ANAEMIA, DYSPEPSIA, AND RHEUMATISM

WITH PARTICULAR REFERENCE TO TREATMENT

BY

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I. Historical Introduction

Interest in the problem of dental infection and its relationship to general disease is said to go back to the days of Hippocrates (Kersley, 1938), but the earliest reference of importance is an article by Rush (1818) claiming that a case of arthritis of the hip was cured by the extraction of infected teeth. Black (1918) cited evidence to show that dental infection was considered responsible for infections of the eye as early as 1842. Canton (1880) gave brief reports of cases in which defective and infected teeth were said to have led to dyspepsia, constipation, and even sciatica. He considered the mechanical factor more important than the infective, and claimed great benefit from the use of dentures. Ten years later Garretson (1890) noted the association of chronic periodontitis with "rheumatic and toxical conditions as well as with scurvy and phosphorus poisoning," but he was not inclined to regard the teeth as the primary cause. Miller (1891) collected 149 cases of serious complications of dental infections. These complications were, however, nearly all acute inflammatory conditions. Rheumatism and anaemia do not appear among the recognized complications of dental sepsis at that time, but dyspepsia was sometimes attributed to the swallowing of pus.

William Hunter (1898, 1900, 1904) in a series of articles further emphasized the importance of swallowing pus as a cause of gastritis and "septic anaemia." In later articles (Hunter, 1911) he pointed out that in addition to open and obvious infection, sepsis concealed by crowns and bridges might play a decisive part. A few years later Billings (1916) and Rosenow (1914a, 1914b, 1915, 1916) published a series of articles on dental infection as a cause of systemic disease, and stressed particularly the "closed" apical infection, which only a radiograph could reveal, as being an important cause of chronic toxaemia, rheumatism, nephritis, and many other conditions. The conception of dental sepsis as a major cause of chronic systemic disease really dates from that time. The present common practice of extracting septic teeth in diseases of obscure origin followed directly from this theory.

In the past twenty-five years such a large number of papers have been published on the subject of focal dental infection that it would be impossible to discuss them all in a short article. The following brief summary will review some of the arguments in favour of the theory that dental sepsis can lead to systemic disease, and the main criticisms which have been, and can be, raised against them.

II. Summary of Recent Work

When teeth are infected a variety of organisms may be found in the mouth, but streptococci, especially non-haemolytic varieties, are generally held to be responsible for systemic disease secondary to dental sepsis (Weston Price, 1923; Rhoads and Dick, 1932; Bulleid, 1930). Following extraction of teeth these streptococci may be found in the blood stream (Okell and Elliott, 1935), and possibly manipulation of the teeth or chewing (Ryle, 1938) may lead to the same result. Infective endocarditis, moreover, may follow dental extraction if the heart valves are previously damaged by rheumatism or are congenitally defective. These cases indeed afford the most clear-cut example of focal dental infection leading to systemic disease.

Attempts to produce gastric and arthritic lesions have been made by the experimental injection into animals of streptococci derived from the dental alveoli. Gastric lesions, arthritis, and nephritis (Rosenow, 1916; Weston Price, 1923) have been produced, but such lesions are acute, and either heal rapidly or lead to death. The claim has been made (Rosenow, 1914b) that streptococci may show "elective localization" for some particular parts of the body. Thus streptococci isolated from the teeth of patients with arthritis are said to cause arthritis on injection, while those obtained from patients with peptic ulceration lead to gastric lesions. This work, however, does not seem to have been confirmed in this country (Appleton, 1934). Moreover, streptococci cannot usually be isolated from the joints in rheumatic conditions (Okell, 1937) or from gastric ulcers (Hurst and Stewart, 1929). Some therefore talk of "streptococcal overload" (Bulleid, 1936) or "toxaemia acting as a contributory cause" (Broderick, 1936). This is mere conjecture.

We are not in a position to discuss the bacteriology fully. There is a prima facie case at least that infective endocarditis may arise by spread of infection from the teeth to the blood stream. But it does not appear that

any strong case can be made for the view that anaemia, peptic ulcer, or the different types of chronic rheumatism are caused by a streptococcal infection arising in the mouth or elsewhere. Indeed, none of Koch's postulates is satisfactorily fulfilled.

Bacteriological evidence being inconclusive, many writers have tried to obtain clinical evidence for the theory. Here all workers have encountered the same difficulties. Before the advent of dental radiology the recognition of dental infection depended entirely on inspection, and attention was therefore largely confined to pyorrhoea and acute alveolar abscess. Subsequently, when it became possible to demonstrate rarefying osteitis about the roots of "dead" or pulpless teeth, these were extensively studied. Haden (1924) and Weston Price (1923) came to the conclusion that this "closed" or latent form of infection was more important than the "open" or obvious dental infection. Recently, however, it has been pointed out that even in "open" cases of pyorrhoea toxic absorption from pocketing may occur, and this, it is held, may then be responsible for systemic disease (Fish, 1937; Fish and Maclean, 1936). According to Rhoads and Dick (1932) even "radiologically negative pulpless teeth" may be important septic foci. The practical conclusion remains, however, that without radiology it is impossible to assess the degree of dental sepsis, and even with its aid estimation is uncertain. This difficulty invalidates much work already published.

Dental sepsis at one time or another has been held to be the cause of anaemia, dyspepsia, and rheumatism. We will discuss these conditions in turn.

Anaemia

Since the introduction of liver therapy for pernicious anaemia and the fuller understanding of haematopoiesis which has followed, dental sepsis has received little attention as an aetiological factor in anaemia. In a recent review (Wilkinson, 1936) dental sepsis is not mentioned at all. It may seem, therefore, that to include anaemias in this discussion is to exhume unnecessarily a buried and forgotten theory. History is, however, instructive. In 1904 Hunter pointed out that in cases of anaemia the mouth was often grossly infected, and he described cases in which treatment of the mouth had led to great improvement in the anaemia. A number of further isolated successes were then recorded. The importance of streptococci in the duodenum was next discussed in relation to achlorhydria (Woodwark and Mackenzie-Wallis, 1912), and the orthodox treatment of pernicious anaemia came to include the eradication of even the smallest septic focus in the mouth (Hurst, 1923). This in practice meant that the patient was rendered edentulous in nearly every case, but he seldom derived any benefit from this procedure. In spite of these depressing results the theory of dental sepsis continued to dominate the treatment of pernicious anaemia, until the advent of treatment with liver (Willcox, 1923). It then sank into oblivion with dramatic rapidity, which suggests that it had little to support it, and that it had merely served as a convenient cloak for ignorance. The danger of lightly assuming that infected teeth are the cause of systemic disease is well illustrated in pernicious anaemia, and the question naturally arises whether the evidence is more convincing in other conditions.

Dyspepsia

A large number of articles have been written to show that dental sepsis is more common among cases of peptic ulceration and carcinoma than among controls. Steadman (1923) found a high incidence of dental sepsis in gastric and intestinal carcinoma, though these figures were severely criticized in a leading article (*Lancet*, 1923) shortly afterwards. In Holland, where the incidence of gastric carcinoma is much higher than in this country, the incidence of dental sepsis is said also to be much higher (Herbert and Bruske, 1936). The series published by Hurst and Stewart (1929) shows that among 187 patients with proven peptic ulceration (positive radiographs) only 16 per cent. had sound teeth. In a control series there were 43 per cent. with "sound teeth." The number of edentulous patients and patients with open sepsis was greater in the "ulcer" than in the control group. In Lossius's (1937) series of 308 cases (half with peptic ulcer and half with "functional" dyspepsia) only 10 per cent. were dentally sound, while in a control series only 25 per cent. were in a "deplorable dental and oral state." The evidence is not very convincing, but it may be that the incidence of dental sepsis is higher among patients with peptic ulceration and gastric carcinoma than among the general population.

The results of dental treatment in cases of peptic ulceration and in "functional" dyspepsia are difficult to assess. Lossius states that of 100 cases having dental treatment 30 per cent. remained symptomless over periods of one to four years, while of 228 without dental treatment only 17 per cent. remained symptomless. These figures can be criticized in many ways, though they probably are the best that can be obtained. Other treatment in the form of diet and alkalis was given to all patients, and, indeed, it would have been unjustifiable to do otherwise. Those patients who consented to dental treatment were probably also the ones who carried out the rest of their treatment most conscientiously. In many long-standing and intractable cases all the teeth had probably already been extracted without benefit before first attending Lossius's clinic. The period of follow-up was not long enough, as relapse may often occur after two, three, or even four years of freedom from symptoms. If the number who relapse be considered, the figures are 70 per cent. and 83 per cent. respectively, and with such a high incidence of recurrence in both groups the relatively slight difference does not seem convincing evidence of the value of dental treatment in this condition.

Rheumatism

Dental infection has probably been more discussed and more radically treated in this group of conditions than in any other. As the aetiology of the rheumatic conditions is not understood, any form of classification must be tentative, but at the same time some subdivision is clearly necessary. The conditions which principally require discussion here are acute or subacute polyarthritis, often referred to as "rheumatoid arthritis"; a chronic type usually mono-articular, referred to as osteo-arthritis; and a non-articular group called fibrositis or muscular rheumatism. Statistics on the incidence of dental infection in such cases vary widely. Moorehead (1916), in America, gives the incidence of apical infections of the teeth as 89 per cent. among seventy patients with arthritis, while it was about 70 per cent. in 150 controls. Irons (1916) gives a figure of 76 per cent. among "arthritic patients" against 44 per cent. in an unselected series of 124 cases. Glover (1923), in this country, estimates the percentage of "clean mouths" in rheumatoid arthritis as 6 to 10, and in the general population as 14 to 20. His paper, unlike many, at least gives some idea of the type of arthritis under consideration, but it does not seem to

afford conclusive evidence that any causal relation between rheumatism and dental infection actually exists.

Undoubtedly the removal of infected teeth is occasionally followed by a marked improvement in an acute or subacute arthritis. Isolated examples of this are found in the literature (Billings, 1916; Haden, 1924; Weston Price, 1923; Tiemann and Schittenhelm, 1934), and are even recorded by those who consider the importance of dental infection in arthritis to be grossly exaggerated (Bach, 1935). These isolated examples are of doubtful significance, as the course of the disease is always variable and other forms of treatment, especially rest and heat, are generally and very properly used simultaneously. No satisfactory comparison has yet been made between cases treated without eradication of dental sepsis and those in which eradication has been practised. Indeed, as is mentioned in a later section, it is almost impossible in practice to collect such a series. Pemberton's (1929) series, which is an attempt to elucidate this point, includes many varieties of the rheumatic diseases. The individual groups are therefore small, but they certainly do not suggest that the eradication of septic foci improves the results of treatment to any great extent.

It is now fairly widely admitted that cure of rheumatic conditions following dental extraction is the exception rather than the rule (Bennett, 1931; Broderick, 1936), and Kersley (1938), in a review of dental infection in rheumatism, admits that the results are often disappointing even in the rheumatoid group, which he considers the most definitely infective. It is argued that in advanced cases cure could not be expected, as irreversible changes have taken place in the joints, and that in some cases other septic foci are present and keep up the infection. Both these statements may be true of particular cases, but they do not affect the main conclusion that eradication of dental sepsis is only occasionally of value in the treatment of rheumatic diseases.

Summary.—Dental infection has been claimed as a causal factor in anaemias, dyspepsias, and rheumatic diseases. The evidence in each case has been derived partly from experimental bacteriology, partly from a statistical study of the incidence of the two conditions, and partly from the results of treatment. All three lines of evidence have been subjected to serious criticism. The bacteriology does not fulfil Koch's postulates. The high incidence of dental infection in these conditions, if indeed it really is significant statistically, does not necessarily indicate a causal relation. The results of treatment are distinctly equivocal.

III. Clinical Observations

The relation, if any, between dental sepsis and dyspepsia or rheumatism is difficult to establish. The obvious way to investigate this problem would be to collect 100 cases of dyspepsia and 100 cases of rheumatism, investigate the dental conditions, and subject half the cases with dental sepsis in each group to dental treatment and let the other half remain untreated as controls. But after a year's trial we abandoned this method of investigation as being impracticable, for the following reasons:

1. It is difficult to assess or classify in any satisfactory way the various types of rheumatism and dyspepsia.

2. The variation in the degree of dental sepsis present in these cases is great, and it is difficult to assess this with any degree of accuracy.

3. There is a tendency in dyspepsia and rheumatism to spontaneous remissions, often extending over long periods.

4. Treatment such as the use of alkalis in dyspepsia, and empirical methods in rheumatism, can hardly be withheld, or, if withheld, the patient seeks and obtains treatment elsewhere.

5. Many patients refuse dental treatment, or come to hospital for the first time having already had their dental condition radically treated elsewhere.

It is these difficulties which have nullified all attempts to prove the relation between dental disease and dyspepsia or rheumatism, and which account for the present unsatisfactory position of the theory of focal sepsis.

During the course of a preliminary investigation along these lines, however, we were impressed by the large number of patients attending a general out-patient clinic who were already edentulous. We therefore decided to ascertain from every edentulous patient who came to the clinic for any reason:

(*a*) When he had had all his teeth out;

(*b*) Why he had had all his teeth out—that is, whether for purely dental reasons, or on account of rheumatism or dyspepsia; and

(*c*) If on account of rheumatism or dyspepsia, whether these symptoms had been ameliorated, had remained the same, or had become aggravated.

These patients were all attending a general out-patient clinic which was not restricted to any particular type of disease. They therefore represented a relatively unselected group. As, however, a large clinic for the investigation and treatment of rheumatic conditions coexists in the same hospital, the proportion of cases of rheumatism attending our department was much less than would otherwise have been the case.

Admittedly this method of approach must give a one-sided picture of the situation. We have seen the failures—the cases in which dyspepsia or rheumatism has followed or has not been relieved by radical dental treatment. Cases in which removal of the teeth has restored the health, or cured rheumatism or dyspepsia, will not have come our way as a rule. We maintain, however, that if the failures are numerous, then grave doubt is thrown on the wisdom of applying the theory of focal sepsis as a guide for the treatment of these conditions.

The result of this investigation of 234 edentulous patients may be stated in the following way:

Group A—Teeth extracted for purely dental reasons	126 (54%)
Group B—Dyspepsia present before extraction	76 (32%)
Group C—Rheumatism present before extraction	13 (6%)
Group D—No satisfactory history obtainable	19 (8%)

We have subdivided the cases of dyspepsia into two types—the peptic ulcer type and the functional type. We have included under the heading "dyspepsia of peptic ulcer type" those cases in which pain was a prominent feature, had a definite relation to meals, and was relieved by alkaline powders. In many of these cases the diagnosis of ulcer was confirmed by radiography, but we have not hesitated to include under this type those cases in which the radiograph was negative, provided the history was typical in these respects, and also cases with haematemesis. (Presumably in these patients the ulcer is too small to be visible, or the local gastritis is still in the pre-ulcerative stage.) We have included under the heading of "dyspepsia of a functional type" those cases in which pain was not a prominent feature and the main symptoms were discomfort, nausea, fullness after meals, and flatulence. These cases are often labelled chronic gastritis, nervous dyspepsia, chronic cholecystitis, or visceroptosis, according to the fashion of the day and the views of the physician. More accurate diagnosis is probably impos-

sible. For the patients complaining of rheumatic symptoms no subdivision has been attempted because, as has been explained above, they were too few to give any satisfactory indication.

GROUP A.—*Cases in which all the Teeth were Extracted for Purely Dental Reasons, and No Symptoms of Rheumatism or Dyspepsia had been noticed Before that Time*

Cases developing dyspeptic symptoms after extraction of all teeth			39 (31%)
Developed dyspeptic symptoms at once:			
Of a functional type	8		
Of peptic ulcer type	1		
Haematemesis	1		
	10	(8%)	
Developed dyspeptic symptoms 2 or more years later:			
Of a functional type	13		
Of peptic ulcer type*	10		
Developed carcinoma of stomach†	6		
	29	(23%)	
Cases developing rheumatic symptoms			19 (15%)
Cases not developing rheumatic or dyspeptic symptoms			68 (54%)
			126

* Seven of these confirmed radiologically or at operation.
† Five of these confirmed radiologically or at operation.

GROUP B.—*Cases in which Dyspeptic Symptoms were Present Before all the Teeth were Extracted (76 Cases)*

Permanently relieved			6 (7%)
Organic dyspepsia (duodenal ulcer)	1		
Functional dyspepsia	5		
Not permanently relieved:			
Peptic ulcer type*			27 (36%)
Aggravated	6		
Temporarily improved	4		
Unchanged	17		
Functional type			41 (54%)
Aggravated	9		
Temporarily improved	8		
No change	24		
Developed carcinoma†			2 (3%)
Total number of cases not relieved			70 (93%)

* Nineteen of these were confirmed radiologically or at operation.
† Both of these confirmed at operation.

GROUP C.—*Cases in which Rheumatic Symptoms were Present Before all the Teeth were Extracted (13 Cases)*

Symptoms relieved	5
Symptoms not relieved	8

As the foregoing method did not give any indication of the relation of dental sepsis to anaemia, we took the opportunity to study the dental condition of fifty-two patients attending a special haematology clinic. We are indebted to Dr. Donald Hunter for leave to investigate these patients in this way. The results may be summarized as follows:

	Macrocytic (Pernicious) Anaemia	Microcytic (Hypochromic) Anaemia
Edentulous for many years before onset of symptoms of anaemia	13	10
All remaining teeth removed when anaemia first diagnosed	4	1
Patients with obviously infected teeth	9	10
Patients with apparently sound teeth	—	5
Totals	26	26

In all these cases the condition of the blood had been fully investigated and treated successfully, and the diagnosis was not in doubt. The dental condition also could not be doubted, except in those which we have described as having "apparently sound teeth." Here radiology might have revealed infection which was not obvious clinically.

From the practical point of view two salient features emerge even from a small series such as this. The removal of dental sepsis by extraction will not prevent the onset of macrocytic or microcytic anaemia, and the presence of dental sepsis will not prevent a satisfactory response to treatment with liver preparations or iron as the case may be.

Discussion

The theory of focal sepsis has now been under discussion for over twenty years, and sepsis in relation to the teeth has been used to explain numerous diseases of obscure aetiology. In Germany and France the theory has not been generally accepted, but in this country, and to a greater extent in the United States of America, it is still widely held, and eradication of septic foci, if present, is usually part of the routine treatment of rheumatism and dyspepsia.

Our experience, however, in an out-patient clinic of a general hospital has led us to question the wisdom of the uncritical adoption of this practice. Frequently we have come across patients who have consulted a doctor on account of rheumatism, dyspepsia, or vague ill-health, and have been sent to a dental surgeon for an opinion on teeth which looked unhealthy. In these patients the doctor's opinion has been confirmed, and the dental sepsis has been found to be more extensive than was at first supposed. Even so, in many of them some teeth were probably in fair condition and might have been retained. But a partial denture would then have been necessary, and this would almost certainly have had to be replaced by complete dentures in a few years. They consequently have preferred, for reasons of economy, to have all the teeth extracted together. Few insured persons could afford the expense of temporary dentures for immediate use, and these patients had therefore to wait for a considerable time until their gums had hardened and retracted sufficiently to have permanent dentures fitted. Under the National Health Insurance Act a minimum period of three months must elapse between extraction and the fitting of dentures; but in practice this period was seldom less than six months in these patients, and meanwhile they had had to eat as best they could without any natural or artificial teeth. Dyspepsia developed for the first time or was aggravated soon after the extraction of septic teeth in so many of these cases that we have come to the conclusion that the mechanical factor introduced by the lack of natural teeth is at least as important as, possibly even more important than, the toxic factor in the pathogenesis of dyspepsia which is supposed to be associated with chronic dental sepsis.

The view is widely held that dental sepsis is a common cause of indigestion. There is, however, so far as we can see, no convincing evidence of this. In our experience indigestion is often started or aggravated by the removal of septic teeth. We have come to the conclusion that in the treatment of dyspepsia, particularly in elderly subjects, the removal of teeth must only be advocated with caution, because, even if the primary cause of the dyspepsia can really be removed in this way, a serious mechanical factor is introduced, and the patient's condition is often not only not improved but may actually be aggravated. There are various reasons for this. The patient may be left without any teeth for several months. When dentures are fitted they are by no means always satisfactory. They may fulfil their aesthetic functions but be useless for the purpose of mastication. We have come across a number of patients who take their dentures out to eat their meals. In other cases dentures are more satisfactory, but they may yet be a poor and inefficient substitute for natural teeth. There may, of course, be instances in which dyspepsia is actually cured by removal of septic teeth. As we have already explained, these cases would not come our way, but we are inclined to think that their improvement may be attributed not so much to the removal of the septic factor as to the replacement

of inefficient natural teeth by dentures which are more efficient mechanically. In the prophylaxis of dyspepsia, therefore, a healthy mouth is of great value in order that sound natural teeth may be conserved as completely and as long as possible. When they are lost immediate and faultless prosthetic dentistry is essential.

The relation between dental sepsis and rheumatism is even more uncertain. We do not wish to underrate the importance of a healthy mouth in the maintenance of the general health, or the efforts of dental surgeons to accomplish this ideal. The fact remains, however, that there is no convincing evidence that dental sepsis is a cause of rheumatism. Our own series is admittedly too small to give any satisfactory indication, but it seems probable that all forms of rheumatism can arise for the first time in an edentulous patient and that, apart from the mechanical factor, which does not arise, the position is similar in rheumatic conditions and in dyspepsias. Furthermore, gross dental infection is apparently compatible with good general health. It is suggested, therefore, that teeth should be treated on their merits in each case, regardless of what rheumatic or dyspeptic symptoms may also be present. Indiscriminate removal should not be advocated on the theory that it will influence the course of the disease.

Summary

An inquiry has been made into the after-histories of 234 out-patients in whom all the teeth had been removed for various reasons.

Seventy-six of these patients had previously suffered from dyspepsia, and the teeth had been removed on the theory that dental sepsis was responsible for their condition. Six had been benefited. Thirteen had previously suffered from rheumatic symptoms, and extraction of septic teeth appeared to have had a beneficial effect in five cases.

In 126 cases the teeth had all been extracted for purely dental reasons. Thirty-nine of these patients developed symptoms of dyspepsia, and nineteen developed symptoms of rheumatism.

The widely accepted relation between dental sepsis and dyspepsia and rheumatism is questioned. The mechanical factor, due to inadequate teeth, would appear to be more important than the septic factor in the pathogenesis of dyspepsia.

A healthy mouth is valuable largely because it leads to conservation of the teeth. When extraction cannot be avoided, early, adequate, and efficient prosthetic dentistry is essential in the prophylaxis of all types of dyspepsia.

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POTASSIUM TELLURITE IN THE DIAGNOSIS OF DIPHTHERIA

BY

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An annotation in the *British Medical Journal* of December 3, 1938 (p. 1152), drew attention to a paper published by Dr. Manzullo of Buenos Aires on the possibility of bedside diagnosis of cases of diphtheria with pharyngeal exudate. Reference to this paper (Manzullo, 1938) showed the following points or claims:

1. A 2 per cent. solution was made of potassium tellurite in distilled water. Care was taken to avoid heating above a temperature of 40° C. in effecting the solution. The solution was said to lose its efficiency after a month.

2. The solution was applied to various throat exudates by means of a swab, care being taken to avoid touching the tongue in so doing.

3. From five to ten minutes afterwards the throat was examined, and in some cases a definite darkening of the exudate was observed.

4. This procedure was applied to a series of seventy-five cases showing pharyngeal exudate. Of these cases forty were bacteriologically diphtheria, and darkening was observed in thirty-seven of them. In the thirty-five cases not due to diphtheria no darkening was seen at all.

These figures suggested that diagnosis on the presence or absence of diphtheria in cases with a pharyngeal exudate could be made simply and easily at the bedside with an accuracy of 96 per cent. With a view to corroborating this work a similar investigation was started at the Leicester City Isolation Hospital, and the results obtained are described and discussed below.

The Technique used in the Present Investigation

The solution as described was effected with little difficulty. Experiments on the "keeping power" of the solution confirmed Dr. Manzullo's findings that it was unwise to use a solution more than four weeks old. The darkening when it occurred was obvious. One case of

late darkening suggested the wisdom of making a first observation after ten minutes, and if that proved negative a second observation after thirty minutes, rather than the single observation after five to ten minutes as suggested by Dr. Manzullo.

Results

The test was applied to forty-six cases: forty-four were admitted to the hospital as diphtheria or suspected diphtheria, and two were cases of scarlet fever. With the exception of the two scarlet fever cases no selection at all was exercised. Two cases were rejected on the grounds of faulty technique—one from the use of an old solution of tellurite and the other from inefficient application of tellurite, which was recognized at the time. The results of the tests are given in the following tables.

TABLE I.—*Comparison of the Diagnoses by the Tellurite Method, Bacteriologically, and by the Clinical Impression given by the Case on First Sight*

Tellurite Test Diagnosis	Bacteriological Diagnosis	First Impression of Clinical Diagnosis	Number of Cases
+	+	+	26
+	+	−	2
+	−	+	3
+	−	−	7
−	−	−	6

The bacteriological diagnosis was made by growth on Loeffler's medium and typing on McLeod's tellurite-chocolate-agar and sugar fermentations in all cases. In doubtful cases guinea-pig inoculation was carried out.

Observations on Table I.—(*a*) Of the forty-four cases twenty-eight were proved to be cases of diphtheria. Obvious darkening was obtained in twenty-seven of these, and in the twenty-eighth case darkening was suspected after ten minutes and definite after thirty minutes. No case of diphtheria would have been missed by placing reliance on the tellurite test. (*b*) One case was diagnosed finally as diphtheria on clinical grounds in spite of failure to recover the bacillus bacteriologically. This case showed darkening. (*c*) Of the forty-four cases fifteen were decided on bacteriological and clinical grounds not to be diphtheria. Six of these cases failed to show darkening in the test. Nine of them did, however, show darkening, an unexpectedly high number of what might be called "false positives."

TABLE II.—*Correlation of the Rate and Depth of Darkening in Positive Cases (Diphtheritic and Non-diphtheritic)*

	Diphtheritic	Non-diphtheritic	Totals
Cases observed under 10 minutes: Darkening to extent "A" ..	1	1	2
" " " "B" ..	5	3	8
" " " "C" ..	8	2	10
" " " "D" ..	2	0	2
Cases observed at 10–20 minutes: Darkening to extent "A" ..	3	0	3
" " " "B" ..	1	0	1
" " " "C" ..	1	0	1
" " " "D" ..	1	0	1
Cases observed at 20–30 minutes: Darkening to extent "A" ..	3	0	3
" " " "B" ..	1	3	4
" " " "C" ..	3	0	3
" " " "D" ..	0	0	0

(Darkening "A" = black colour; "B" = very dark grey; "C" = light but obvious grey; "D" = slight but definite grey.)

TABLE III.—*Correlation of the Depth of Darkening and Age of Solution Used*

Age of Solution	Number of Cases Darkening to Extent			
	"A"	"B"	"C"	"D"
Under 7 days	4	7	5	2
7–14 "	2	2	7	0
14–21 "	2	3	2	1
Over 21 "	0	1	0	0

TABLE IV.—*Correlation of Depth of Darkening and Day of Disease in Diphtheria*

Day of Disease	Number of Cases Darkening to Extent			
	"A"	"B"	"C"	"D"
1st	0	0	0	1
2nd	3	3	2	1
3rd	3	2	9	0
4th and over	0	1	3	0

Observations on Tables II, III, and IV.—No distinction in character, rate, or intensity of darkening could be made out in diphtheritic and non-diphtheritic cases, and there was no demonstrable variation with the extent of advancement of the disease or the freshness and potency of the solution used.

Type of Diphtheria Bacillus in the Series.—Of the twenty-eight positive cases the organism was of the gravis type in twenty-six and of the mitis type in two. No intermediate type was met with, but it appears unlikely that the type of organism makes any obvious difference in the degree of darkening obtained.

Discussion

The figures suggest that in cases of diphtheria a correct diagnosis cannot be made by reliance on the test owing to the high number of false positive results obtained. In those cases in which a negative result is obtained, however, one may be fairly safe in assuming that the case is not one of diphtheria. The high number of false positive results was surprising in view of the fact that in the Manzullo series none at all was obtained. A review of the technique revealed no error in the preparation or strength of the solution used, in the method of its application, or in the method of assessing a positive result, and the conclusion was reached that in the series there must have been a large number of non-diphtheritic exudates containing bacteria other than the Klebs-Loeffler bacillus which would produce a darkening.

From the routine examination of tellurite media the prevalence of such organisms in such numbers might not be expected until it is realized that darkening in the throat and darkening on a tellurite medium differ in two respects: first, the throat organisms may have been growing for a much longer time than those seen on the routine examination of a tellurite plate after twenty-four hours; and, secondly, the throat organisms are subjected to the darkening effect of the tellurite, but not to its inhibitory action on their growth. Reference to the literature shows that besides the *Corynebacterium diphtheriae* many other organisms give a dark colony when grown for some time on a tellurite medium. The Medical Research Council publication *Diphtheria* (1923), summarizing the work of Conradi and Troch, Douglas, and others, states: "It is universally conceded that besides the *C. diphtheriae* other corynebacteria, staphylococci, and sarcinae give

blackish colonies also." Anderson, Happold, McLeod, and Thomson (1931) also describe dark colonies due to *B. influenzae*, some streptococci, and certain proteolytic aerobes as occurring on their tellurite medium. Sutherland and Iredale (1937) describe a dark colony on Clauberg's medium due to a Gram-positive bacillus.

In the nine false positive results in this series staphylococci were recovered from the throat in five cases and diphtheroids in two; in the other two cases no investigation was made apart from the exclusion of the diphtheria bacillus.

In the course of the investigation it was found that if a growth of the Klebs-Loeffler bacillus on Loeffler's medium was subjected to the application of the tellurite solution used for the throat experiments and retained at body temperature in the incubator for about twenty minutes definite darkening of the colonies would occur. Acting on the assumption that this reaction *in vitro* was comparable to that obtained *in vivo* in the throat, the following experiment was undertaken.

EXPERIMENT TO DEMONSTRATE THE PREVALENCE OF NON-DIPHTHERITIC THROAT FLORA THAT MIGHT GIVE RISE TO DARKENING

A batch of forty-four swabs sent in from the city in the usual way were plated out on Loeffler's medium. The majority of these came from the presumably healthy throats of school children swabbed in an attempt to discover a diphtheria carrier. After eighteen hours' incubation the growths were examined for the Klebs-Loeffler bacillus. In no case was the diphtheria bacillus found. The tellurite solution was then applied to the cultures, and they were returned to the incubator for half an hour. At the end of this time, on examination thirty-six out of the forty-four cultures were seen to show definite darkening. The prevalence of non-diphtheritic organisms which showed darkening in this experiment confirmed the impression that the percentage of potential false positive results in this tellurite test must be very high.

The difference between the figures obtained in this series and those of Dr. Manzullo can possibly be explained by the assumption that epidemicity occurs in all those organisms which give darkening, whether pathogenic or not, and that they may be present in exudates in sufficient numbers to give darkening with the test even though they are not necessarily the causative organism. It is possible that there may have been in this series an epidemic increase in some such organism.

Summary

The technique of this suggested clinical test for diphtheria is simple.

A negative result is of value in that it supposes with great accuracy (100 per cent. in this series, 92 per cent. in that of Dr. Manzullo) that the disease is not diphtheria.

It is unlikely that any case of diphtheria would be missed through reliance being placed on the test, if the technique were not at fault.

Such a high percentage of false positive results may be obtained that no definite diagnosis of diphtheria should be made on a positive result.

It is possible theoretically, and in view of the discrepancy between these results and those of Manzullo, that the proportion of false positive results will vary from place to place and from time to time.

This test can in no way take the place of the clinical and bacteriological methods of diagnosis already in use.

I should like to thank Dr. Mackenzie, medical superintendent of the hospital, for permission to undertake and publish this work and for the help he has given throughout its course. I should also like to thank Dr. Ward, city pathologist, and his staff for help on the bacteriological side.

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THE IMMEDIATE TELLURITE TEST IN DIPHTHERIA

BY

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Since Conradi and Troch (1912) suggested the addition of calcium tellurate to a medium for the isolation of *Corynebacterium diphtheriae* the value of this method of distinguishing its colonies has been generally recognized. Later workers who devised modifications of the earlier media recommended the use of potassium tellurite instead of calcium tellurate. Owing to the power of *C. diphtheriae* or its products to reduce these salts of tellurium, colonies of *C. diphtheriae* have a distinctive appearance, being black or greyish-black in colour. Reducing activity towards tellurite is not shown only by *C. diphtheriae*, and a variety of organisms commonly present in throat swabs exert a similar action, which causes colour changes in their colonies. *C. hoffmanni* and other organisms of the diphtheroid group, streptococci, and staphylococci form colonies of a greyish-black colour, while *B. proteus* and some Gram-positive spore-bearing bacilli grow as brownish colonies. A fuller account of these appearances is given by Allison and Ayling (1929), and they also note that a characteristic somewhat pungent odour is emitted from cultures of *C. diphtheriae* on their improved medium.

In a recent communication Manzullo (1938) of the Bacteriological Institute of the National Department of Hygiene at Buenos Aires describes a method of rapid diagnosis in cases of diphtheria. A 2 per cent. solution of potassium tellurite is prepared, the salt being dissolved in distilled water at a temperature not above 40° C. This solution should be renewed at intervals of thirty days. A swab dipped into the solution is applied to the membrane or exudate on the patient's throat. If the infection is caused by *C. diphtheriae* the area that has been in contact with the swab is said to show obvious blackening within five to ten minutes. If not, there should be no change in colour. The tongue should not be touched, since its surface is the only part of the buccal mucous membrane which possesses the power under normal conditions of blackening potassium tellurite. The throat should not have been recently treated with hydrogen peroxide, tannic acid, or methylene-blue. Manzullo states that in sixty-nine out of seventy-five patients with pharyngeal exudate the immediate tellurite test, the provisional clinical diagnosis, and the result of bacteriological culture corresponded. In three of the remaining six cases the tellurite test and culture were in complete agreement. While the culture was positive in three cases with a negative test, in no other case was the test positive with

a negative culture. A high degree of agreement was thus shown to exist between the test and the recognized methods of diagnosis in diphtheria.

Present Investigation

In view of the knowledge that such a variety of bacteria commonly present in throat infections exhibit reducing activity towards tellurite in artificial media, it was thought that confirmation of the specificity of the test was required. We decided, therefore, to apply the method in a series of 200 unselected patients with pharyngeal exudate, the diagnosis being established by the clinical appearances and bacteriological culture. For the most part, cultures on Loeffler's medium were examined on three successive days before a case was pronounced negative for *C. diphtheriae*. In approximately fifty cases two cultures were examined, and the presence of *C. diphtheriae* was confirmed by isolation of the organism, virulence tests, and typing into gravis, mitis, and intermediate strains. In assessing the clinical diagnosis we considered the results of bacteriological examination before admission to hospital as well as the local appearances in the fauces.

After a slight experience of the test it was found that some cases of diphtheria required more than one application of the tellurite solution before a positive result could be obtained. This was attributed to the mechanical difficulty of application, especially in a young patient, and 40 per cent. glycerin in distilled water was substituted as the solvent for the potassium tellurite. This fluid adheres more effectively to the swab and to the fauces, and does not in any way affect the reading of the test. Approximately two-thirds of the cases were investigated with this solution. If the exudate showed no blackening at the end of ten minutes the test was recorded as negative, and throughout our series we saw no results which suggested the advisability of lengthening this period.

In about one hour after performing the test a pungent garlic odour is detectable in the patient's breath. This has been described by Allison and Ayling (1929) as characteristic of tellurite plates containing a growth of *C. diphtheriae*; in our cases, however, the odour has not been entirely limited to diphtheritic infections. The smell is persistent, often remaining for several weeks after the faucial condition has cleared up; but, while unpleasant to the attendants, it is apparently not objectionable to the patient.

Analysis of Results

The results of investigating the tellurite contact test, bacteriological culture, and the final clinical diagnosis in 200 patients with pharyngeal exudate or pseudomembrane are analysed and classified in Tables I, II, and III.

TABLE I.—*Tellurite Contact Test and Bacteriological Culture*

Tellurite Positive	—	Culture Positive	....	108 cases
,, Negative	—	,, Negative	....	27 ,,
,, Positive	—	,, Negative	....	43 ,,
,, Negative	—	,, Positive	....	22 ,,

We have compared in Table I the tellurite contact test with bacteriological examinations for *C. diphtheriae* after admission to hospital. In 151 (75.5 per cent.) of the 200 cases a positive immediate tellurite reaction was obtained, while *C. diphtheriae* was grown on culture in 130 cases (65 per cent.). The findings on culture and on application of the tellurite test were in agreement—that is to say, either both positive or both negative—in 135 cases (67.5 per cent.). Dissimilar results were found in sixty-five cases (32.5 per cent.); in twenty-two cases negative to the tellurite test culture was positive, and in forty-three cases a positive test was not confirmed by the bacteriological examinations. Of the 130 cases from which *C. diphtheriae* was grown on culture, 108 (83.1 per cent.) gave a positive tellurite reaction. In forty-three (61.4 per cent.) of the seventy cases in which *C. diphtheriae* was not isolated a positive reaction to the tellurite solution was observed.

TABLE II.—*Tellurite Contact Test and Clinical Diagnosis*

Tellurite Positive :	Diphtheria ..	..	129 cases
,, Negative :	Not Diphtheria	..	25 ,,
,, Positive :	,, ,,	..	22 ,,
,, Negative :	Diphtheria ..	..	24 ,,

In Table II we have analysed the results of the tellurite test in comparison with the final clinical diagnosis. The clinical diagnosis was assessed in the manner previously indicated. In all, twenty-three cases have been transferred from the non-diphtheritic to the diphtheritic group; bacteria morphologically resembling *C. diphtheriae* had been found in throat cultures of twenty-two patients before admission to hospital, and one patient showed the characteristic clinical features of diphtheria, though unconfirmed by culture. Of the 200 cases 153 were diagnosed as diphtheria. A positive tellurite reaction was found in 129 (84.3 per cent.) of the cases of diphtheria, while twenty-four cases (15.7 per cent.) gave a negative result. In 154 cases (77 per cent.) the findings of the test and the clinical diagnosis agreed in being positive or negative. Of the forty-seven cases in the non-diphtheritic group twenty-two (46.8 per cent.) showed a positive reaction on applying the tellurite solution.

The value of the immediate tellurite test as an aid to the diagnosis of diphtheria would depend on its yielding a high proportion of positive results in diphtheria and negative findings in other pharyngeal infections. To summarize, we may state that the tellurite test was positive in 83.1 per cent. of cases where we found *C. diphtheriae* on culture and in 84.3 per cent. of cases finally diagnosed as diphtheria. A positive tellurite test was noted in 61.4 per cent. of cases in which *C. diphtheriae* was not found after admission to hospital, and in 46.8 per cent. of cases in which the diagnosis of diphtheria was satisfactorily excluded.

The exclusive use of the classical Loeffler method of culture has been criticized as unsatisfactory in view of the aberrant morphology of certain strains of *C. diphtheriae gravis*. Brahdy and his colleagues (1934) were able to furnish accurate reports in 83 per cent. of cases of clinical diphtheria within eighteen hours by the Loeffler slope method. We would claim greater accuracy, since in most of our cases examinations were done on three successive days before recording a negative bacteriological finding. Where the appearances on staining were suspicious, culture was continued up to twenty-four to thirty-six hours. This opinion is borne out by our figures, which show that *C. diphtheriae* was found in 130, or 86.3 per cent., of the 153 cases finally diagnosed as diphtheria. We consider, therefore, that a stringent standard was used in requiring negative findings on three successive days for the exclusion of diphtheria.

The apparent failures of the test have been submitted to a detailed examination. Of the twenty-four cases of diphtheria with negative reactions to the tellurite test eight showed scanty patches of membrane, and the absence of blackening might be explained on this ground. Six patients with severe tonsillar or nasopharyngeal diphtheria gave a negative tellurite reaction, and in three of these cases repeated applications failed to produce any darkening of the membrane. Individual differences in reducing activity towards tellurite have been noted by Stuart (1938) in some starch-fermenting strains of *C. diph-*

theriae, and a lowered reducing power *in vivo* might explain the absence of reaction in some cases. A slightly higher proportion of negative reactions was found in cases from which a gravis strain was obtained, but the thirty typed cases in our series are too few to give conclusive evidence on this point.

TABLE III.—*Non-diphtheritic Cases* (47)

Diagnosis	No. of Cases	Tellurite Contact Test	
		Positive	Negative
Tonsillitis	34	16	18
Scarlet fever	9	3	6
Vincent's angina	4	3	1

In Table III we have analysed the forty-seven cases of non-diphtheritic infections. Sixteen of the thirty-four cases of tonsillitis, three out of the nine cases of scarlet fever with tonsillar exudate, and three out of the four cases of Vincent's angina without associated diphtheria were positive on testing by the tellurite method. As controls these cases are open to the objection that in some instances their allocation to the non-diphtheritic group depended on excluding diphtheria by bacteriological methods. Reasons which support our opinion that a high degree of accuracy in this respect has been achieved are stated in an earlier section of this paper. In ten of the twenty-two patients positive to the tellurite test the clinical features suggested a diagnosis of streptococcal tonsillitis, scarlet fever, or Vincent's angina, and were not compatible with diphtheria.

Discussion

As has often been emphasized before, the death rate in cases of diphtheria increases with delay in the administration of antitoxin. The only safe course open to the practitioner is to base his judgment on the clinical appearances and give antitoxin immediately if a provisional diagnosis of diphtheria is made. Since the significance of the findings is often doubtful in cases which show exudate on the throat, any bedside procedure offering immediate and reliable confirmation of a diagnosis of diphtheria would be of obvious value. The immediate tellurite test raised hopes of a high degree of usefulness in practice, if the apparent specificity of the reaction was confirmed on extended trial by other workers.

Some technical limitations of the test have been mentioned above—namely, the necessity for frequent renewal of the solution and the difficulty of applying it to a resistive patient. Without assurance of adequate application a negative result is unreliable. The reading of the test may be subject to confusion in the presence of natural greyness of the diphtheritic pseudomembrane.

Positive results have been obtained in a considerable proportion of patients with other pharyngeal infections such as tonsillitis, scarlet fever, and Vincent's angina. A small percentage of cases of diphtheria show no reaction to the test while recognizable by clinical appearances or routine bacteriological methods. Mild cases of diphtheria may fail to give a positive reaction owing to scantiness of the patches of membrane. We have not found the tellurite test helpful in the nasopharyngeal type of diphtheria, where early diagnosis is of great importance. No blackening occurs in this form when the local lesion is in the early phase of oedematous swelling, with an ill-defined pellicle of membrane. Some cases of nasopharyngeal diphtheria with widespread membrane gave a negative result even after repeated applications.

In view of these serious objections reliance cannot be placed on the immediate tellurite test in confirming or excluding a clinical diagnosis of diphtheria, and it cannot replace bacteriological methods at present in use. Speed and reliability in the morphological diagnosis of diphtheria have been improved by the use of specially prepared swabs, as described by Solé (1934) and Brahdy and others (1934). In special circumstances when bacteriological confirmation of the clinical diagnosis was desired urgently we have been impressed with the value of the method of rapid culture by the Folger-Solé swab. In the main the clinical appearances must continue to be the primary and decisive means of diagnosis in diphtheria.

Summary and Conclusions

Two hundred cases of pharyngeal infection with exudate have been examined by the immediate tellurite test. Correspondence with bacteriological diagnosis was obtained in 67.5 per cent., and with clinical diagnosis in 77 per cent. of cases.

Definite blackening of the membrane occurred in a high proportion (84.3 per cent.) of cases of diphtheria.

Similar blackening occurred in a proportion (46.8 per cent.) of faucial lesions due to other organisms.

No blackening occurred in a small number of cases of diphtheria, often of a severe type.

With careful application, therefore, a negative finding affords presumptive evidence against diphtheria, but a positive finding does not establish the diagnosis. Though the test possesses a certain value, in view of the anomalous results in some cases of non-diphtheritic infections and severe diphtheria it cannot replace clinical diagnosis, either alone or supplemented by cultural methods.

We are indebted to Dr. G. W. Ronaldson, medical superintendent of the South-Eastern Hospital, and to Dr. H. S. Banks, medical superintendent of the Park Hospital, for facilities to carry out this investigation, and to certain of our colleagues for their help in the clinical and laboratory work.

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A new link in a chain of special institutes established in connexion with the University of Stockholm, an institute for biological research, was recently opened by the Crown Prince of Sweden. The new institute has been made possible largely through a generous grant from a fund established by the Swedish industrial magnate Axel Wenner-Gren, whose name it bears, and through other donors, including the Rockefeller Foundation and the late B. A. Hjort, the city of Stockholm contributing the site. The purpose of the institute is to facilitate research into the basic features of the physiology of the cells and tissues, with the double object of increasing knowledge and creating a broader basis for medicine. It comprises five departments: for cellular physiology, evolutionary physiology and heredity, physiological chemistry, metabolic research, and biophysics, respectively. The department for metabolic research is the link between theoretical research and practical clinical work, and the principal metabolic derangement which is there to be studied is diabetes. The new institute, with which several of Sweden's foremost scientists are associated, will maintain constant contact with Swedish medical institutions as well as industrial establishments, in order to contribute more directly to improvement of practical working conditions.

TREATMENT OF CEREBROSPINAL MENINGITIS

A REVIEW OF 103 CASES

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Introduction

The limitations of serum in the treatment of cerebrospinal fever affecting the youngest age group of the population have been known for many years. In their classical work on cerebrospinal fever Worster-Drought and Kennedy (1919) give the mortality for cases under 2½ years as over 75 per cent., and the published statistics of other authors have in the main agreed with this figure. At Cork Street Hospital our case mortality in past years among this age group conformed to the accepted rates in spite of daily spinal drainage and intensive intrathecal serum therapy. A definite improvement followed the introduction of sulphanilamide, which since 1937 had been used as an adjuvant to intrathecal serum therapy, but still the general mortality rate for the cases was 57 per cent. Then last autumn came M & B 693. Its introduction to Ireland happened to synchronize with the assumption by one of us (W. J. R.) of duty as resident medical officer at the hospital. We began to use M & B 693 at the same time as we decided to abandon the orthodox intrathecal route for serum administration. The results obtained showed a dramatic improvement. Not only did ten out of eleven consecutive cases recover (five of these patients being under 1 year of age, and all, except one, being infants or young children), but the clinical improvement in the individual cases was considerably speeded up and none of the successful cases developed any permanent disability. The case mortality in the under 1 year group was actually reduced from 78.26 per cent. among a series of forty-six cases treated by the old methods to 16.66 per cent. in a series of six cases treated by the new. A remarkable feature was the complete absence of hydrocephalus, which hitherto had been a very frequent occurrence in recovered cases of posterior basic meningitis.

The one death in the series occurred quite suddenly from respiratory failure when the child seemed to be responding to treatment. This phenomenon of sudden respiratory failure during the acute stage of the disease is well attested. Worster-Drought and Kennedy (1919), quoting Fairley and Stewart, mention that it occurred no fewer than nineteen times in one series of cases. It is obvious that no method of treatment, however efficacious, can be expected to eliminate the risk of this chance happening.

It has to be admitted that the series here reported as treated by the "new method" is very small as compared with the large number of cases treated by intrathecal serum. For this the time interval since the introduction of M & B 693 is alone responsible. In the seven months which have elapsed since that drug became available in Ireland all cases admitted to Cork Street Hospital have been treated with it and the intrathecal route of serum avoided (the "new method"). For nearly two years before October, 1938, all our cases received prontosil album and/or soluseptasine, with intrathecal serum following daily spinal drainage (the "intermediate method"). For the two years previous to that (1935 and 1936) the treatment was the same as the "intermediate" without the addition of sulphanilamide in any form (the "old method"). No element of selection was observed at any stage: all the cases of confirmed cerebrospinal meningitis treated in the hospital since January 1, 1935, are included in this survey. One of us (W. J. R.) was personally responsible for the detailed treatment of all the cases in which the "new method" was used.

As to whether the same improvement in results would have been obtained by using M & B 693 alone, without serum given extrathecally, we are not in a position to say, but it seemed to us reasonable to endeavour to neutralize the toxaemia, which is part of the clinical picture in meningococcal meningitis, by the intravenous and intraperitoneal administration of specific antibodies while relying on chemotherapy to produce the antibacterial effects. The drainage of the canal for a few days seemed also indicated to lessen pressure symptoms, and, at the very least, it afforded a means of assessing the progress of the case by physical, cellular, and bacteriological examination of the cerebrospinal fluid withdrawn.

Review of Cases

The object of this paper is to describe and compare results of the different modes of treatment of cerebrospinal meningitis employed in Cork Street Hospital from the beginning of 1935 up to the present time. The review concerns 103 cases and covers a period of four and a quarter years. Broadly speaking, the methods of treatment employed during the period under review were:

Old Method: 1935–6.—Daily spinal drainage followed by intrathecal and intramuscular serum therapy until the cerebrospinal fluid was clear and sterile.

Age of Patient	Cases	Recovered	Deaths	Case Mortality per cent.
0–1 year	17	1	16	94.11
1–5 years.. ..	7	3	4	57.14
5–15 „	4	1	3	75.00
15–25 „	5	2	3	60.00
Over 25 years ..	3	2	1	33.33
Total	36	9	27	75.00

Intermediate Method: 1937 to September, 1938.—The treatment was the same as in 1935–6, with the addition of prontosil album orally and/or soluseptasine intramuscularly.

Age of Patient	Cases	Recovered	Deaths	Case Mortality per cent.
0–1 year	29	9	20	68.96
1–5 years.. ..	13	7	6	46.15
5–15 „	9	5	4	44.44
15–25 „	3	1	2	66.66
Over 25 years ..	2	2	0	—
Total	56	24	32	57.14

New Method: October, 1938, to April, 1939.—(1) M & B 693 orally; (2) avoidance of intrathecal therapy;

(3) intravenous and intraperitoneal serum therapy; (4) daily spinal drainage until cerebrospinal fluid was clear and sterile.

Age of Patient	Cases	Recovered	Deaths	Case Mortality per cent.
0–1 year	6	5	1	16.66
1–5 years	3	3	0	—
5–15 ,, ...	1	1	0	—
15–25 ,, ...	—	—	—	—
Over 25 years ..	1	1	0	—
Total	11	10	1	9.09

The above tables show the results analysed according to age.

Details of Cases treated by New Method

As shown, these numbered eleven; six were under 1 year of age, and in this group the only death in the series occurred. The following is a brief résumé of all the cases treated.

Case I

A male aged 7 months was admitted from St. Ultan's Hospital on October 20, 1938, as a case of meningitis—eleven days ill before admission: clinically a meningitis. Lumbar puncture, performed at St. Ultan's, had yielded a turbid fluid which contained meningococci. Lumbar puncture on each of four succeeding days yielded successively 16 c.cm., 30 c.cm., 16 c.cm., and 15 c.cm. of cerebrospinal fluid. Meningococci were present in the first two. The fourth specimen was normal.

Treatment.—Twenty c.cm. of A.M.S.* was given intramuscularly on the day of admission and on the next day. On the third and fourth days 20 c.cm. of M.A.T.† were administered intraperitoneally. M & B 693, 0.25 gramme four-hourly, was given for five days, and also soluseptasine, 2 c.cm. morning and evening. (The strength of soluseptasine was 10 per cent. in each case in which it was given in this series.) Response was immediate and marked. The notes on October 25, 1938 (sixth day in hospital) were as follows: "Child much better; no head retraction or rigidity, expression bright, taking nourishment well. Child able to sit up.—W. J. R."

The subsequent course of the case was uneventful—the child made a complete recovery, and was discharged on the twenty-sixth day of the disease (sixteen days after admission to Cork Street Hospital) apparently perfectly normal.

Case II

A female child aged 4 months, admitted from the National Children's Hospital on October 28, 1938, the fourth day of the disease. Signs of meningitis well marked. Baby in very emaciated condition. Purpuric rash all over body. Temperature on admission 102° F.; pulse 160. Patient gravely ill. Salines were given by the subcutaneous and continuous rectal drip methods. Eighteen c.cm. of what appeared to be pure pus was obtained by lumbar puncture, and on examination was found to contain meningococci in considerable numbers. Four subsequent lumbar punctures were done. In three of these specimens meningococci were present. The last specimen was clear and contained no meningococci.

Treatment.—Large doses of meningococcal serum were given by the intravenous, intramuscular, and intraperitoneal routes—in all 200 c.cm. of serum, in divided doses. M & B 693, 0.25 gramme, was given four-hourly, as well as soluseptasine in doses of 2 c.cm. morning and evening, until the fluid was clear. Although the child was very ill for several days, the following note was made on November 3 (sixth day after admission): "Condition very satisfactory. Colour improved. No head retraction; able to move head from side to side. Baby looks quite intelligent. Taking feeds well. An urticarial serum rash present."

The subsequent course of the case was uneventful. There was a slight pyrexia lasting about two days associated with an urticarial serum rash, but recovery proceeded rapidly, and on the twenty-second day of the disease (two and a half weeks after admission) the child was able to be discharged, and appeared to be normal both physically and mentally.

Case III

A man aged 55 was admitted from St. Michael's Hospital, Dunlaoghaire, on November 14, 1938, the fifth day of the disease. The case was clinically a meningitis, with neck rigidity and some head retraction. Spinal puncture yielded 14 c.cm. of very turbid fluid under marked tension; it contained meningococci, with excess in polynuclears and no sugar. Twenty c.cm. of A.M.S. was given intramuscularly on admission, followed some four hours after by 30 c.cm. of M.A.T. intravenously with 40 c.cm. of glucose. On the following day (the sixth of the disease) the patient was drowsy, had slight head retraction, and still showed the classical signs of meningitis. Thirty c.cm. of M.A.T. intravenously and 10 c.cm. of soluseptasine were given twice a day, as well as 1 gramme of M & B 693 four-hourly. A lumbar puncture yielded 50 c.cm. of turbid fluid under tension; the fluid still showed meningococci and excess of polynuclears. On this night 30 c.cm. of M.A.T. was repeated intravenously, with 40 c.cm. of glucose. On the third day (the seventh of disease) the patient's general condition was fairly good. He was not so drowsy, his pupils were equal and reacted briskly to light. On this day he received 30 c.cm. of M.A.T. intravenously and the same amount of A.M.S. intramuscularly in the evening. Ten c.cm. of soluseptasine was still given morning and evening, and also 0.5 gramme of M & B 693 four-hourly. Lumbar puncture yielded 15 c.cm. of turbid fluid under less tension. This fluid for the first time showed no meningococci. The patient did not subsequently undergo spinal puncture, but on the following two days (the eighth and ninth days of disease) received 30 c.cm. of M.A.T. intravenously as well as 0.5 gramme of M & B 693 four-hourly.

The subsequent course of the case was uneventful: the patient made an uninterrupted recovery, his temperature never rising after the second day, even though a serum rash developed about ten days after his admission to hospital. He was discharged on December 6 (just three weeks after admission) physically and mentally normal. He was the first adult patient serum-treated in Cork Street Hospital for meningococcal meningitis by completely extrathecal routes.

Case IV

A female child aged 2, admitted from the Adelaide Hospital on November 24, 1938, the seventh day of illness. On admission the case was clinically one of meningitis, but the patient suffered concurrently from scarlet fever and aural diphtheria. She was gravely ill when admitted, and her life was despaired of during the first week. A lumbar puncture was done on six successive days. She drained badly on the second and the fourth punctures. Meningococci, present in the cerebrospinal fluid on the first occasion, were not found subsequently.

Treatment.—In all, 240 c.cm. of meningococcal serum was given by intravenous, intraperitoneal, and intramuscular routes. M & B 693, 0.5 gramme four-hourly, was given for five days, as well as 2 c.cm. of soluseptasine morning and evening over the same period. Recovery was slowly effected because of a troublesome serum rash of an urticarial and morbilliform type which appeared at different periods. Facial paralysis developed on the ninth day; this eventually cleared up. Internal strabismus also developed: this was most pronounced at first, but gradually improved, and was very slight when the child left the hospital on January 7, 1939. The ear discharge remained positive for *Corynebacterium diphtheriae* for several weeks, and necessitated the prolonged stay in hospital.

* A.M.S. = Polyvalent anti-meningococcus serum (Mulford).
† M.A.T = Meningococcal antitoxin (P. D. and Co.).

Case V

A boy aged 7 years was admitted from the Children's Hospital, Temple Street, on January 5, 1939, the fifth day of the disease. He had been taken to Temple Street on that day, and turbid cerebrospinal fluid was obtained by lumbar puncture there. A lumbar puncture was done at Cork Street on five successive days. Only the first two specimens contained meningococci.

Treatment.—Thirty c.cm. of A.M.S. was given intramuscularly on admission, followed by a daily intravenous injection of 30 c.cm. of M.A.T. for four days. M & B 693, 0.5 gramme four-hourly, was given for five days. He was discharged on February 13 (five weeks after admission). This boy's protracted stay in hospital was due to deafness, which eventually cleared up.

Case VI

A boy aged 5 years, admitted on February 7, 1939, the fifth day of illness. The cerebrospinal fluid was very purulent, containing meningococci in considerable numbers. This was a sharp case. A lumbar puncture was performed on five successive days (15 c.cm., 38 c.cm., 8 c.cm., 30 c.cm., and 48 c.cm. of cerebrospinal fluid were obtained respectively). Meningococci were absent after the first two punctures.

Treatment.—Eighty c.cm. of M.A.T. intravenously and 100 c.cm. of M.A.T. intraperitoneally were given in divided doses during the first four days. M & B 693, 0.5 gramme four-hourly, was administered on the first day, being increased to 1 gramme four-hourly on the second day; but as it was taken reluctantly 5 c.cm. of soluseptasine was given twice daily for four days.

The boy was discharged perfectly well on March 10, after four weeks in hospital.

Case VII

A female child aged 11½ months was admitted from St. Ultan's Hospital on February 17, 1939, the third day of the disease. A lumbar puncture performed at St. Ultan's had revealed meningococci in the cerebrospinal fluid. The baby was in a wasted and dehydrated condition on admission. The clinical signs of meningitis were present, and there was marked head retraction and arching of the back. The pupils were dilated and reacted sluggishly to light. Diarrhoea and vomiting were present; respirations were 44, bronchopneumonia was well marked. Salines were given subcutaneously and by continuous rectal drip. Lumbar puncture after admission yielded 20 c.cm. of very turbid cerebrospinal fluid; on February 18 punctures were done morning and evening, but yielded only a few c.cm. of very turbid fluid. On the 19th 10 c.cm. of cerebrospinal fluid, withdrawn by lumbar puncture, showed a clearer fluid, and on the 21st 30 c.cm. withdrawn proved to be absolutely clear.

Treatment.—Thirty c.cm. of A.M.S. was given intramuscularly on admission (February 17, 1939); on February 18 50 c.cm. of M.A.T. intraperitoneally, and also 4½ oz. of glucose saline (5 per cent.) into the peritoneal cavity at the same time; and M & B 693, 0.5 gramme four-hourly, daily until February 21, when the dose was halved. On the 23rd M & B 693 was discontinued. All signs and symptoms of meningitis had disappeared at this stage. The baby was discharged on April 8, looking normal in every way.

The prolonged stay in hospital (seven weeks) was not associated with the meningitis. We had a good deal of trouble with the baby's feeding before we got her back to normal weight.

Case VIII

A male child aged 4½ months, admitted from St. Ultan's Hospital on February 25, 1939. Two days ill before admission. Signs of meningitis well marked. Anterior fontanelle tense; diarrhoea and vomiting present. Seven lumbar punctures were done before the cerebrospinal fluid was free of meningococci.

Treatment.—Twenty c.cm. of A.M.S. was given intramuscularly on admission, and an intraperitoneal injection of M.A.T. on three successive mornings (30 c.cm., 40 c.cm., and 30 c.cm. respectively). M & B 693, 0.5 gramme, was given four-hourly on the first day and 0.25 gramme four-hourly every day until the fluid was clear. This baby did not take M & B 693 well in the beginning on account of the constant vomiting, and this may account for the delay in getting the cerebrospinal fluid sterile. (Saline was given by subcutaneous and continuous rectal drip for the first three days.)

The baby was discharged on March 20 (a little over three weeks after admission) normal in every way and considerably increased in weight.

Case IX

A boy aged 3 years 3 months was admitted on March 11, 1939, as a case of meningitis. He was very rigid, with marked arching of the back. Lumbar puncture after admission revealed a very turbid cerebrospinal fluid with large flakes of pus which came away with difficulty; 40 c.cm. of what looked like pure pus was withdrawn. Meningococci were present in large numbers. A puncture was performed on the three succeeding days and again after an interval of one day—five punctures in all. The cerebrospinal fluid on the last occasion was clear and sterile.

Treatment.—Forty c.cm. of M.A.T. intraperitoneally was given on admission, followed next morning by 20 c.cm. of M.A.T. intravenously. A rather severe rigor occurred after intravenous injection. On each of the next two mornings 30 c.cm. M.A.T. was given intraperitoneally. Recovery was uneventful, except for serum rashes, and the child was allowed up two weeks after admission. He was marked for discharge at the end of another week, but unfortunately got an attack of tonsillitis, which delayed his departure from hospital until April 13. In all he was thirty-four days in hospital. This child received 0.5 gramme of M & B 693 every four hours for the five days immediately following admission.

Case X

A male child aged 1 year was on March 22, 1939, admitted from the Children's Hospital, Temple Street, where he had been taken that day. He had been sick for about ten days, according to the mother. A lumbar puncture had been performed at Temple Street, and as a result of the findings the baby was sent on to us. The classical signs of meningitis were present. We withdrew 12 c.cm. of very turbid cerebrospinal fluid that evening.

Treatment.—Twenty c.cm. of A.M.S. was given intramuscularly and 0.25 gramme of M & B 693 four-hourly. The following note was made next morning: "Rigidity less marked—colour poor—face very pale—heart rapid and tone soft—general condition rather poor. Prognosis not good." A spinal puncture was done, but only a few c.cm. of fluid which looked like pure pus were obtained. It came through the largest needle with the greatest difficulty, and contained meningococci. Fifty c.cm. of M.A.T. was given intraperitoneally and 10 c.cm. of M.A.T. intramuscularly, with 0.5 gramme of M & B 693 four-hourly. Coramine was also given. One of us (W. J. R.) saw the baby at 11.45 o'clock that night. He looked better and had taken his feeds well during the day. There was no vomiting. He died quite suddenly with symptoms of respiratory paralysis at 5 o'clock the next morning.

Post-mortem Findings in Brain Specimen.—On incising the dura the meninges bulged. Pus was present under the meninges, with marked basal distribution, and the basal exudate appeared to be organizing in places. The meningeal vessels were somewhat congested. No haemorrhages were found, nor was there any observable focal suppuration. The brain tissues were unaffected.

Case XI

A female child aged 1 year. This case, the eleventh and last of this series, was the best so far as response to treatment is concerned. When admitted on April 6, 1939, the fourth

day of illness, well-marked signs of meningitis were present. Lumbar puncture on four successive days yielded respectively 30 c.cm., 33 c.cm., 30 c.cm., and 35 c.cm. of cerebrospinal fluid. The first two specimens were turbid and contained meningococci. The last specimen was clear, and the cell count was normal.

Treatment.—On the day of admission 80 c.cm. of M.A.T. was given intraperitoneally, and on the following morning 30 c.cm. of M.A.T. intravenously. M & B 693 0.5 gramme was given four-hourly for the first three days, followed by 0.25 gramme four-hourly for one day. On April 12 she was sitting up playing with her toys. She was discharged, looking perfectly normal, on the twelfth day of her stay in hospital.

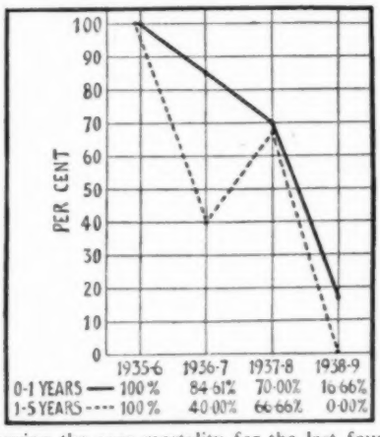

Chart showing the case mortality for the last four periods October to March.

The graph (kindly drawn for us by Dr. J. G. Tynan, one of our medical officers) compares the case mortality among the age groups 0–1 year and 1–5 years during each successive period October to March, beginning October, 1935, to March, 1936, and ending October, 1938, to March, 1939. It may be assumed that the virulence of the prevailing organism in each of the periods was more or less uniform.

As a control there were two cases (not included in the foregoing) which had received intrathecal serum before admission to Cork Street Hospital, but which were treated by the new method after admission to hospital. Both these patients died, although the details of their treatment differed in no way from those of the patients who recovered.

We are kindly permitted by Dr. W. R. F. Collis (physician, National Children's Hospital, Dublin) to say that following our line of treatment at Cork Street Hospital he has had four recoveries among five cases treated, aged respectively 5 months, 8 months, 2 years, and 3 years. His fatal case was that of a patient aged 3 months, and was of the fulminating type. Dr. Collis's method was similar to that employed in Cork Street Hospital, except that he did not drain the spinal canal so frequently and gave rather less serum.

Summary

Eleven consecutive cases of fully authenticated meningococcal meningitis treated with M & B 693, extrathecal serum, and spinal drainage are reported with one death, a case mortality of 9.09 per cent.

Six of the patients were under 1 year of age, and of these five recovered—a case mortality of 16.66 per cent. for this age group, as compared with 78.26 per cent. in a series of forty-six cases under 1 year of age treated by the older method of intrathecal serum. None of the cases treated by the new method developed hydrocephalus or other disability.

In the one fatal case of the series death occurred suddenly from respiratory failure during the acute stage of the disease.

Generally speaking, within three or four days of the beginning of treatment a striking clinical improvement was noticed, as contrasted with a much more delayed reaction in the cases successfully treated by the older methods.

The good results of this line of treatment were confirmed by a smaller series of cases treated along similar lines—that is, M & B 693 plus extrathecal serum—by Dr. W. R. F. Collis.

We take this opportunity of thanking Dr. W. P. O'Callaghan, the hospital bacteriologist, for his thorough and careful examinations of nearly fifty specimens of cerebrospinal fluid submitted to him from the cases treated with M & B 693, as well as for his necropsy on the one fatal case in the series.

REFERENCE

Worster-Drought, C., and Kennedy, A. Mills (1919). *Cerebrospinal Fever*, A. and C. Black, London.

⁂ Since this article was submitted for publication three further bacteriologically confirmed cases have been treated successfully by the above method. The patients were aged 4 months, 9 months, and 19 years respectively. The latter, a military case, was covered in a petechial rash on admission, all three patients being desperately ill. These cases bring the figures in this series to fourteen consecutive cases with thirteen recoveries, a case mortality of 7.14 per cent. Eight of the patients were under 1 year of age and seven recovered, giving a mortality rate of 12.5 per cent. for that age group.

THREE CASES OF CEREBROSPINAL FEVER TREATED BY M & B 693

BY

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Three cases of cerebrospinal fever were recently admitted to the hospital under the care of Dr. L. G. Mackey. They were each treated by the administration of M & B 693 and by daily lumbar punctures. In view of the fact that such treatment is a recent innovation the details are briefly recorded.

Case I

A man aged 49 was admitted at 7 p.m. on February 1, 1939, having complained four days before of general malaise beginning with a rigor, and having suffered from headache, vomiting, and severe abdominal pain for the last two days. On admission his temperature was 100.4° F., his pulse rate 100, and his respiration rate 29. His mental condition was stuporous, but he could be aroused without difficulty. He had considerable neck rigidity and a bilateral positive Kernig sign and a positive Brudzinski sign. Several small petechiae were present on the arms, trunk, and legs. Lumbar puncture disclosed turbid cerebrospinal fluid under a pressure of over 300 mm. Direct films of the cerebrospinal fluid showed many polymorphonuclear cells and a number of intracellular and extracellular Gram-negative kidney-shaped diplococci. Culture yielded a Gram-negative diplococcus which agglutinated Group I meningococcal serum almost to titre. The biochemical findings were: chlorides, 658 mg.; sugar, 12 mg.; and protein, 440 mg. per 100 c.cm.

M & B 693 was given by mouth in the doses shown below. Daily lumbar puncture was performed until the fluid was at normal pressure on two successive days. The temperature and pulse became normal by the following morning, and by the third day there was a great improvement in the patient's

general condition, with diminution of neck rigidity. On the fifth day a crop of herpes appeared about the mouth and under the chin, while the petechiae had faded. At this stage there was a slight recurrence of pyrexia, which failed to respond to further doses of M & B 693. By the twelfth day no signs of meningitis remained; the patient was bright and cheerful, and his convalescence has since progressed uneventfully except for the slight pyrexia referred to above, which has now subsided. Estimations of M & B 693 in the cerebrospinal fluid showed the highest concentration attained to be 23 mg. per 100 c.cm.

Day of Treatment	Dose in Grammes of M & B 693	Cerebrospinal Fluid			
		Pressure	Amount Removed	Turbidity	Cell Count per c.mm.
		mm.	c.cm.		
1	4	300+	25	Very turbid	+++
2	7	300+	17	Turbid	+++
3	4	230	16	Hazy	768
4	3	220	17	Almost clear	—
5	–	20	4	Clear	117
6	–	172	22	,,	—
7	4	110	12	,,	—
8	3	150	23	,,	105
23	–	70	6	,,	32

Case II

A man aged 44 was admitted in the afternoon of February 5, 1939, with a three-days history of headache and vomiting beginning with a rigor, and of slurring of the speech, deafness, and pains in the limbs for the last twenty-four hours. On admission his temperature was 97.4° F., his pulse rate 68, and his respiration rate 24. He was practically unconscious and had a bilateral external strabismus—which was corrected when he was aroused—sordes of the lips, and stertorous breathing. Neck rigidity was present, and Kernig's sign was positive on the right side. Petechiae occurred on the legs and abdomen, and there was extreme tenderness of the left hip and groin. Lumbar puncture showed turbid cerebrospinal fluid under a pressure of 270 mm. Direct films of the cerebrospinal fluid

Day of Treatment	Dose in Grammes of M & B 693	Cerebrospinal Fluid			
		Pressure	Amount Removed	Turbidity	Cell Count per c.mm.
		mm.	c.cm.		
1	–	270	15	Turbid	+++
2	6	150	20	,,	+++
3	6	—	20	,,	++
4	4	260	25	Slightly turbid	—
5	4	—	15	,, ,,	—
6	5	150	22	Clear and yellow	—
7	3	150	15	,, ,,	97
8	–	100	10	Clear	—
17	–	70	7	,,	26

contained many polymorphonuclear cells with intracellular and extracellular Gram-negative kidney-shaped diplococci. Unfortunately these organisms failed to grow on culture. The biochemical findings were: chlorides 690 mg.; sugar, 8 mg.; and protein, 230 mg. per 100 c.cm.

M & B 693 was given by mouth in the doses shown below, and daily lumbar puncture was performed until the fluid was clear on the eighth day. On the day following admission the temperature rose to 100.4° F., and not until the fourth day was there any improvement clinically, but thereafter improvement was rapid, Kernig's sign becoming negative on the fourteenth day. A heavy crop of herpes appeared round the mouth during this period. As in the first case, a low-grade pyrexia occurred during convalescence and has not yet abated. This pyrexia may possibly be due to apical infection of the patient's teeth, which are grossly carious. *X*-ray examination showed no fewer than fourteen apical abscesses. The highest concentration of M & B 693 obtained in the cerebrospinal fluid was 19 mg. per 100 c.cm.

Case III

A woman aged 33 was admitted at noon on February 17, 1939, with a history of having had a rigor four days before, accompanied by severe headache; on the following day she complained of pain in the neck and limbs, and later became restless and delirious. On admission her temperature was 99.2° F., her pulse rate 94, and her respiration rate 32. She was incapable of understanding questions, and had neck rigidity and positive Brudzinski and Kernig signs. Her eyes showed an external strabismus similar to that of the second case. Lumbar puncture disclosed turbid cerebrospinal fluid under a pressure of more than 300 mm. Direct films of the cerebrospinal fluid showed a marked polymorphonuclear-celled reaction with intracellular and extracellular Gram-negative kidney-shaped diplococci. On culture a Gram-negative diplococcus was obtained which agglutinated Type I meningococcal serum to titre. The biochemical findings were: chlorides, 620 mg. per 100 c.cm.; sugar, 0; protein, 290 mg. per 100 c.cm.

M & B 693 was given by mouth at first; later it was given in 2-gramme doses every six hours, together with fluids, by nasal tube, as the patient became too ill to swallow. Daily lumbar puncture was performed until the seventh day after admission, when the fluid became clear and the pressure had fallen to 128 mm. This patient was extremely ill during the first four days spent in hospital, being unconscious most of that time. Thereafter her improvement was rapid; neck rigidity had gone by the tenth day, and Kernig's sign became negative in fourteen days. There was no prolonged low-grade pyrexia as there had been in Cases I and II. The highest concentration of M & B 693 obtained in the cerebrospinal fluid was 12.3 mg. per 100 c.cm.

Day of Treatment	Dose in Grammes of M & B 693	Cerebrospinal Fluid			
		Pressure	Amount Removed	Turbidity	Cell Count per c.mm.
		mm.	c.cm.		
1	6	300+	40	Turbid	13,800
2	7	300+	25	,,	—
3	5	150	20	,,	—
4	7	300+	45	,,	801
5	6	210	42	Hazy	—
6	4	260	45	Clear	102
7	–	128	15	,,	—
22	–	115	7	,,	31

Summary

Three cases of meningococcal cerebrospinal meningitis were treated by M & B 693 and with daily lumbar puncture. An average dose of 29 grammes of M & B 693 was given.

All cases responded well to the treatment, from six to seven days being required before the cerebrospinal fluid was clear and before the pressure came within normal limits.

Two of the cases showed a low-grade pyrexia during convalescence, although the cerebrospinal fluid was practically normal.

I should like to thank Dr. L. G. Mackey for his permission to publish these cases.

FATAL POISONING BY "META FUEL" TABLETS

BY

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Many cases of poisoning by "meta" tablets have been recorded in Continental literature. In Britain the first case of such poisoning was recorded by Willcox and Mitchell (1927), and later another by Miller (1928). Their patients made a complete recovery. On the Continent a few deaths from meta-poisoning have occurred. On account of the fatal issue in our case, and the opportunity of making a post-mortem examination, we felt it our duty to publish these notes.

Since the introduction of "meta" into domestic life our children's careless days may no longer be a joy but a sorrow. There is a real danger that a child may be ambushed on his inquisitive errands, for this product is supplied by the manufacturers in tablets attractive both in form and in colour. They may be easily mistaken for the popular peppermint lozenge, and a child almost instinctively puts in his mouth anything which reminds him of a sweet. It is true that several attempts have been made to produce a tablet with a disagreeable taste and smell, but so far this has not been possible without diminishing the cheapness of the product and the quality of its combustion. A change in the colour of the tablet was suggested, but it was found that tablets of almost any hue attracted children just as much as its present white colour.

Characteristics of Meta

Meta is the trade name for the product produced by the polymerization of metacetaldehyde, and is imported into Britain from Switzerland, where the first cases of meta-poisoning were observed. Its activity is far greater than that of its isomer paraldehyde. It is supplied in the form of elongated tablets, usually about two inches long and half an inch thick, and has probably gained its present popularity because the tablet is solid, clean, easy to use as a source of fuel in picnics, etc., and lights only in contact with a flame. It burns without smoke, leaves no ash, and is insoluble in the majority of liquids except very feebly in chloroform and benzene. According to Gautier (1928) combustion of meta cannot produce any poisoning. It is not scheduled as a poison and its sale is unrestricted. The gardener has taken advantage of its poisonous character to kill slugs and snails, and the method of mixing it with bran has been responsible for the innocent slaughter of many of our wild birds. It is strange that the manufacturers in their leaflet state that "meta seems harmless to birds." It is slowly absorbed from the intestine, and by its poisonous action on the central nervous system it produces drowsiness and convulsions. The majority of the recorded cases of accidental poisoning by meta have been in young children, and most of the adult cases have been attempts at suicide. The fatalities have all occurred in the young.

Case Report

Our unfortunate patient was a boy aged 2½. So far as we could ascertain he swallowed one tablet only, at about 5.15 p.m. He told his nursemaid that it was not a nice sweet. About twenty minutes later he fell asleep for about an hour, and woke up crying, retching, and complaining of abdominal pain. At 6.45 p.m. he was seen by one of us (G. A. M.), and it was ascertained that a large dose of castor oil had been administered by the mother immediately after the child had swallowed the fuel, but it was mentioned that he had had a large bowel evacuation immediately before doing so. On endeavouring to pass a stomach tube the child vomited; the vomitus contained a few small pieces of fuel, and was practically odourless, apart from a very faint musty smell. Finally the stomach tube was passed successfully, and the stomach washed out with a solution of sodium bicarbonate, the washings containing a few small pieces of fuel. Following this treatment the child appeared relieved, and in about fifteen minutes later fell asleep.

He was seen again at about 8.30 p.m., and, apart from a few attacks of retching, seemed better. At 10 p.m. he woke up from a short sleep complaining of a return of abdominal pain, and had a convulsion which lasted about three minutes. His stomach was once more washed out, and half a pint of saline injected per rectum. He fell asleep again for about half an hour, and awoke with another convulsion, which lasted for five minutes. Convulsions now recurred every ten minutes or so until midnight, when the child lost consciousness completely and the convulsions increased in frequency and lasted for a longer period. Rectal saline was administered at intervals until 2 a.m., when the convulsions became almost continuous. Chloral, 10 grains, and potassium bromide, 20 grains, were given per rectum.

At 1.45 a.m. the child became very much worse, there being only a short interval between the convulsions. The teeth were clenched, risus sardonicus and opisthotonos occurred, and the legs were extended and rigid. The pupils were contracted, the temperature had risen from 98° F. at 6.45 p.m. to 102.4° F. at 2 a.m. The pulse rate was 130 and the respirations 42. At 2.45 a.m. he was admitted to the Swansea General Hospital. He was drowsy and was having frequent convulsions. His temperature was 104° F. and the pulse 140. The pupils were contracted. The limbs were rigid and the reflexes were present. Within a few hours of being admitted to hospital the convulsive attacks further increased in frequency and coma supervened.

In the absence of any known antidote, we emptied the stomach as rapidly as possible, administered chloral and bromide, and gave abundant drinks, especially milk. The child was also given one-tenth grain of apomorphine. All treatment was of no avail, and death occurred within thirty-three hours of swallowing the meta.

In the literature prognosis was said to hang on the suddenness of the appearance of symptoms, on the more or less frequent repetition of the convulsive attacks, and on the rapidity of the coma. When the epileptiform attacks occurred at intervals in spite of persistent coma the prognosis was good. The prognosis depended also on the manner of taking the meta. The more this was divided the greater the rapidity and the more serious the consequences. The chief feature to consider was how soon the spontaneous or provoked vomiting occurred. A case has been recorded where a woman swallowed the enormous dose of six tablets, vomited immediately, became gravely ill, but made a complete recovery.

Post-mortem Appearances

The body was that of a normally developed male child. The skin was intensely pale, that of the face and soles of the feet having a lemon-yellow colour. The brain was congested, and in the white matter there were a number of minute petechial

haemorrhages. The urea of a post-mortem specimen of cerebrospinal fluid was 108 mg. per 100 c.cm. The trachea was normal and the lungs showed areas of collapse and congestion. The tracheal and hilar glands were not enlarged. The heart showed dilatation of the right ventricle and auricle; the muscle was firm but pale, and there were numerous endocardial petechiae in the left ventricle. There were no pericardial haemorrhages, and the quantity and nature of the pericardial fluid were normal. No abnormality was present in the aorta or other vessels.

The oesophagus appeared normal; the stomach was empty and there were small patches of petechial haemorrhages in the mucosa, which was otherwise normal. The jejunum and upper part of the ileum was congested, and contained semi-solid bile-stained material. The lower part of the ileum was pale and contracted so as to admit the ball end of fine scissors with difficulty; the contents consisted of a creamy-coloured odourless paste. The large intestine contained a small quantity of normal faeces. The liver was of normal size, very pale, and of a yellow colour, with patches of haemorrhage about one inch in diameter; the liver pattern was ill defined. The gall-bladder was distended with bile. The kidneys were pale, but there was no other microscopical abnormality. The bladder was empty. The thyroid, pancreas, suprarenals, and thymus were normal in appearance. Microscopical examination of the liver revealed intense fatty degeneration affecting all the liver cells, with zonal necrosis showing pyknotic nuclei and a complete disintegration of the cells, with extravasation of red blood cells into the liver tissue. As there was no excess of bile pigment the yellow colour of the liver presumably was due to fat. The kidneys showed normal glomeruli with swelling and desquamation of the tubular epithelium, and small areas of congested capillaries with red cells lying without the capillary wall. The contents of the lower ileum were submitted to further examination microscopically and chemically. The pasty material consisted of mucus with fine needle crystals which closely resembled those of a meta tablet when ground up in water. A portion of the material was heated in a sealed glass tube at 100° C. for half an hour; a watery solution was then made, and this solution was examined for the presence of acetaldehyde by the iodoform and silver nitrate tests. Both tests gave a positive reaction, but the iodoform test was also positive for a normal stool treated in the same way; the silver nitrate test was negative for the normal stool. Unfortunately no urine was obtained, as the patient was incontinent.

Conclusions

Meta-poisoning has serious possibilities, with a medico-legal significance; for diagnosis may be difficult unless there are reasons to consider such poisoning. So long as its sale is unrestricted it may become the popular choice of the suicide or criminal. The packing of such a dangerous poison in frail cartons is not conducive to safety. Once the carton is opened the tablets may easily drop out and fall within the reach of young children.

To protect the child the public should be warned of meta's dangerous qualities, and the State should introduce measures for a safer distribution.

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Clinical Memoranda

Morphine and Chloroform in Liver Atrophy

The following case seems to be of sufficient interest to be recorded.

CASE REPORT

On September 21, 1938, a man aged 42 was admitted as a voluntary patient to the Royal Edinburgh Mental Hospital. He gave a history of morphine addiction of ten years' duration. A psychopathic state was the predisposing cause, and abdominal pain, appearing after operation for a perforated duodenal ulcer, was the precipitating cause of the addiction. He had been taking as much as 5 grains of morphine sulphate per day by injection, though for the past two years 2 grains was rarely exceeded. Whereas previously he had weighed over 10 st. in health, by the time he was admitted he weighed only 7 st. 4 lb. Previous history of jaundice was negative.

On the first day after admission he was given 1 grain of morphine. Thereafter he required only 1/4 grain for three successive nights, while codeine phosphate was administered in gradually increasing doses as a substitute. The usual general measures were adopted, and in addition he was given 5 units of insulin three times daily, increased at the end of one week to ten units. Though the deprivation symptoms cleared up within a fortnight he continued to complain of vomiting and abdominal pain. He was found to have signs of pyloric stenosis, this being verified radiologically. A large dilated stomach, with abundance of fasting juice and with retention of barium for twenty-four hours, was found. An operation was performed by Mr. C. F. W. Illingworth, under chloroform and ether anaesthesia, with atropine 1/100 grain premedication. A large inflammatory mass was found surrounding the pyloric antrum, and numerous enlarged glands along both curvatures. It was decided to perform a partial gastrectomy, and this was done, together with an end-to-side anastomosis. The operation lasted approximately one and a quarter hours. Not more than 1 oz. of chloroform was used for induction, and approximately 12 oz. of ether during the rest of the operation. On the same night an intravenous drip infusion was set up, and he received by this method about 1,500 c.cm. of a 5 per cent. glucose solution. This was then stopped, and on the second day rectal glucose saline was administered on three occasions. Sips of sterile water were allowed forty-eight hours after operation, and these were gradually increased in frequency and amount. The rectal salines were stopped on the third day. It was at this time that he was observed to be passing brownish-red urine which contained large quantities of amino-acid and cholesterol crystals—the amino-acids recognized being leucine, tyrosine, and cystine. There was no bile and no blood. During the succeeding days he continued to pass these crystals in much the same quantities, although his general condition was well maintained. During the third and fourth days a slight lemon-yellow tinge of jaundice appeared on the skin and mucous membranes. The liver was neither tender nor reduced in size. Severe pain was complained of in the region of the wound, for which small doses of heroin and morphine were given. The temperature was normal throughout. The van den Bergh test gave a weak biphasic direct result. From the first, glucose with insulin 10 units twice daily was given in large quantities. During the second week a marked looseness of the bowels was found, the stools being normal in colour. All these signs have gradually disappeared and the wound has healed well. The patient is now on a normal diet, and the insulin has been stopped. He is putting on weight, being now 7 st. 10 lb., six weeks after operation.

COMMENTARY

The presence of amino-acids and cholesterol in the urine is conclusive evidence of liver destruction, and the amounts were such as to indicate extensive involvement. In spite of this the patient's general condition remained good

and he made a complete recovery. We do not ascribe the liver atrophy solely to the chloroform, as no more than the usual induction dose was used. Nor could morphine alone have been responsible, as there had been no previous jaundice throughout the ten years' addiction, with larger doses. It seems, therefore, that the atrophy was predisposed to by morphine and precipitated by chloroform.

We would suggest that the anaesthetic be chosen with care in any operation required in patients with morphine addiction.

We are indebted to Professor D. K. Henderson for permission to report this case.

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Two Cases of Streptococcal Meningitis of Otitic Origin

The following personal cases, in the second of which treatment was by sulphanilamide combined with serum, may be of interest.

CASE I

A woman aged 65 was referred to me on July 15, 1938. For the previous ten days she had had pain in the right ear for the first time. A muco-purulent pulsating discharge began that morning, with relief of pain, the drum being red. Temperature, 98.4 ; no mastoid tenderness; throat N.A.D. The left ear contained dried wax. July 21: discharge less; small perforation. July 28: discharge more. August 3: discharge less; drum not inflamed. Discharge stops—pain—discharge—no pain.

On August 8 she was admitted to hospital as an emergency, with headache, some neck rigidity, and a positive Kernig sign. The throat was clear, pupils reacted to light (no nystagmus), the right drum was not inflamed, there was no mastoid tenderness, knee-jerks increased, blood pressure 155/70, temperature 98.8°, pulse 98, respirations 20. It was decided that she was suffering from meningitis of otitic origin. The white cells numbered 14,000 per c.mm., with 92 per cent. polymorphs. Lumbar puncture was not thought necessary for diagnosis, and a right cortical mastoidectomy was then, performed, with exposure of the dura of the middle cranial fossa and of the lateral sinus. The mastoid cells were hyperaemic, and a small perisinus abscess was exposed low down, almost on the jugular bulb. During the night her temperature went up to 107.4°, her pulse to 144, respirations 29; she died at 8.20 the next morning.

Post-mortem Examination.—This showed basal meningitis—streptococcal. "Skull and brain: Operation site was exposed and area of small extradural abscess was seen just anterior to the medial end of the right transverse sinus. There was a definite purulent exudate over the base of the brain spreading over the frontal lobes. (Examination of a smear showed streptococci.) No abscess in the brain. Lungs showed extensive old pleurisy with healed tuberculous lesions at both apices. The remaining organs were not examined."

CASE II

A woman aged 38 was admitted as a surgical emergency, having had a discharge from the right ear since 1925. Three days previously earache began in the right ear and the discharge almost ceased. Pain continued steadily until the day of admission, August 14, 1938, when it subsided in the afternoon; but she developed a bad generalized headache and vomited frequently during the afternoon and evening. Bowels were regular; no abdominal pain. Temperature was 99.2°, pulse 128, respirations 20. The patient was flushed and obviously in pain, retching a lot but not bringing up much. The tongue was clean. There was definite neck rigidity, but no facial palsy, mastoid tenderness, or obvious discharge from the ear. The pulse was bounding. Lumbar puncture was performed, using a manometer. The cerebrospinal fluid was under pressure of 190 mm. and markedly turbid.

Treatment was begun that evening with prontosil soluble, 20 c.cm. intramuscularly, also anti-pneumococcus serum Type II, 20,000 units, and polyvalent anti-streptococcus serum, 10 c.cm., and morphine, 1/4 grain. On August 15 she vomited all day. The right ear contained a lot of inspissated discharge, which was removed, and the prontosil and anti-streptococcus serum in the same doses were repeated, with morphine 1/6 grain, at 10.29 p.m. The white cell count was 13,000 per c.mm., with 86 per cent. polymorphs. On the 16th vomiting stopped and the headache was less, and she was given anti-pneumococcus serum Type II, 20,000 units, and prontosil soluble, 5 c.cm. The pathological report on the cerebrospinal fluid was: "Direct films showed pus cells and Gram-positive diplococci, ? pneumococci. On culture streptococci were the chief organism that grew, but it was not a pure culture. A further specimen might yield a positive diagnosis." The temperature, pulse, and respiration rates had not risen. August 17: "Complains of some earache to-day." August 18: lumbar puncture, about 5 c.cm. removed, clear and not under pressure. Report: "No organisms were seen in direct films. The culture was sterile." August 21: temperature 100°; serum rash. August 22: prontosil album, 1 gramme thrice daily for forty-eight hours. August 25: pains in joints, especially jaw. Aspirin, adrenaline, and calcium lactate were given. There was a posterior perforation of the right drum.

On September 3 a right radical mastoidectomy was performed. The dura over the lateral sinus and over the middle cranial fossa was exposed. The mastoid cells were hyperaemic and no abscess was seen. A flap was cut, and the external meatus was considerably enlarged and packed with oiled silk and gauze. On September 24 rotary nystagmus was noticed; a week later there was very little aural discharge, and on October 6 she became an out-patient, and was a little giddy during the first week after discharge from the ward. On October 27 she showed some rotary nystagmus on looking to right or left, and a cold-water caloric test of the ears revealed giddiness after 3½ minutes when water was run into the left ear, but with the right ear there was no giddiness after five minutes. The left ear showed no loss of absolute bone conduction with C 2 tuning-fork, while on the right side there was four seconds loss, this revealing a dulling of cochlear and vestibular parts of the right internal ear. She has since had "snapping noises on the left side of the head" and a feeling of swelling.

On February 2, 1939, the patient had no symptoms except the snapping noises, which had much diminished. Her right ear had been healed and dry for at least a month, and she saw no point in further attendance at the hospital. She looks very well. The culture taken from the mastoid at the time of operation grew one colony of *Staph. albus* only.

These two cases, seen less than a week apart, have features in common and seem to suggest certain conclusions, which may be summarized as:

1. Cessation of aural discharge with recurrence of mastoid pain points to deeper trouble and threatened complications and makes imperative the consideration of immediate mastoidectomy.

2. A painful mastoid which is not tender suggests that the trouble is deep and has the same significance.

3. In the presence of established meningitis operation may have the immediate effect of stirring up the trouble and doing more harm than good.

4. It should be considered whether sulphanilamide combined with serum should replace operation in the immediate treatment of this desperate condition.

My thanks are due to Mr. D. Ligat and Drs. P. Lazarus-Barlow, E. Mason Barker, A. F. W. Hall, P. Dunbar Johnson, Laura Bates, Jessie Mackenzie, Dorothea Lang, and the nursing staffs of the Buchanan and Royal East Sussex Hospitals.

St. Leonards-on-Sea. J. A. KERR, B.Sc., F.R.C.S

Reviews

IODINE IN RELATION TO GOITRE

Iodine and the Incidence of Goiter. By J. F. McClendon. (Pp. 126; 64 figures, 78 tables. 22s. 6d. net.) London: Oxford University Press; Minneapolis: University of Minnesota Press. 1939.

Those interested in the prevention of goitre will be grateful to Professor J. F. McClendon of the University of Minnesota for bringing together into one volume the widely scattered information on the geographical distribution of iodine, its distribution in foodstuffs, and its relation to goitre. The volume abounds in facts, figures, and tables. Following a brief introduction, in which an inverse relation between the distribution of iodine and the incidence of goitre is postulated, a detailed account is given of iodine in air, soil, water, vegetable and animal foodstuffs, of its content in the blood and urine, and of the requirements of the body for it. Then follow an equally detailed account of the distribution of goitre and cretinism throughout the world and a section on the determination of iodine in geological deposits and biological material. There are, as there must be in a compilation of this kind, a number of lacunae which can be filled only by further investigations and the more general application of accurate methods of survey and analysis. But the collection of the existing data into one volume, even though those data be not as accurate and complete as Professor McClendon would have wished, is a notable contribution to the study of a subject which has perplexed investigators since the days of Saint-Lager.

It may be doubted whether, as the author thinks possible, "goiter maps and iodine maps, supposing they existed, would fit like the land fits the ocean, goiter incidence and iodine varying inversely." There are too many exceptions to such a rule; and perhaps in straining after it the cause or causes of these exceptions may be missed. The more recent attempts to establish this inverse relationship have not been conspicuously successful. Thus, v. Fellenberg, to whom we owe the perfecting of methods of iodine determination, has found (1938) no definite correlation between the iodine content of water and food and the occurrence of goitre and cretinism at Blumenstein, Canton Berne; and a possibility of correlation with bacterial contamination of drinking water is suggested. But few will disagree with Professor McClendon that "iodine is not only a drug but also an essential food constituent, and that lack of it may lead to a deficiency disease just as may a lack of a vitamin." He might have added that, as in vitamin-deficiency disease, iodine-deficiency disease may be "conditioned" by a number of factors.

NEURASTHENIA RECONSIDERED

La Dépression Constitutionnelle. L'Ancienne Neurasthénie dans ses Rapports avec la Médecine Générale. Clinique—Biologie—Thérapeutique. By M. Montassut. (Pp. 210; 45 fr.) Paris: Masson et Cie. 1938.

Dr. Montassut holds that a constitutional condition corresponds with what the old authors labelled as neurasthenia. The condition is described fully, and according to the author it is an expression of a degenerative tendency which results in a predisposition to physical and "moral" accidents without great intellectual or organic defect. It is manifested by an irritable weakness and a combination of atony and spasmodic reaction with a mingling of inhibition and impressionability. The depressive reactions correlate with a deficiency and instability of the body fluids with disturbances of balance of the physico-chemical, neuro-vegetative, and endocrine functions. Especially is it associated with alkalosis and abnormalities in the blood content of the alkaline earths. It should be differentiated from senile dementia, general paralysis, post-syphilitic neurasthenia, cerebral syphilis, schizophrenia, melancholia, hypochondria, and various endocrine deficiencies. In treatment all methods of approach should be used—chemical, physical, and psychological—though the author has not much use for psycho-analysis; but since the condition, according to him, is essentially constitutional too much must not be looked for. Many will consider that the condition or conditions described may be more amenable to deep analysis than the author allows; on the other hand, the experienced psychotherapist is well aware that some cases are more resistant than he would expect, and seem to have some constitutional basis. For this reason this work deserves critical consideration by all those interested in what is meant by that much misused word "neurasthenia" and the almost as much misused word "depression."

HYGIENE AND SANITARY LAW

A Synopsis of Hygiene. By Sir W. Wilson Jameson, M.A., M.D., F.R.C.P., D.P.H., and G. S. Parkinson, D.S.O., M.R.C.S., L.R.C.P., D.P.H., Lieutenant-Colonel R.A.M.C. With a Section on Personal Hygiene by G. P. Crowden, D.Sc., M.R.C.S., M.R.C.P. Sixth edition. (Pp. 687; 16 figures. 21s.) London: J. and A. Churchill. 1939.

Sanitary Law in Question and Answer. For the Use of Students of Public Health. By Charles Porter, M.D., B.Sc., M.R.C.P.Ed., and James Fenton, C.B.E., M.D., M.R.C.P., D.P.H. Fourth edition. (Pp. 352. 10s. net.) London: H. K. Lewis. 1939.

The sixth edition of the *Synopsis of Hygiene*, by Sir Wilson Jameson and Colonel Parkinson, adds to the fifth the public health legislation of the intervening three years. The sections dealing with occupation, hospitals, maternal welfare, and milk have been recast with excellent results. The first contains a paragraph on nitrous fumes, which impresses in few words the grave hazard from a source which is too little regarded by many. The references for further study given in the text have always hitherto been a justly admired feature of this work. They have now taken the bit in their teeth and are running away with the text. Alike by their frequency and their dimensions they hold up the earnest reader, who would, we feel sure, be more than grateful if they could be taken out of the text and printed as footnotes. The article on the estimation of the population does not bring out with sufficient clearness the comparative value and appropriate use of the methods described. That on the life table, on the other hand, is a model of such lucidity as the subject permits. The appendix entitled "Climatology" consists mainly of points in meteorology and, though it cites M. Culpin's views on tropical neurasthenia, says too little on climatic conditions in their relation to disease. These, however, are imperfections which can be easily remedied. We shall look forward to extending to the seventh edition of the book the same cordial welcome as we now give to the sixth.

If the making and remaking of laws is any test, the last seven years of public health in this country may be accounted rich in performance by reason of both the number and the quality of the enactments which they have witnessed. It is therefore not surprising that the authors of *Sanitary Law in Question and Answer*, now issuing their fourth edition seven years after the third, should have found it necessary to recast and rewrite the book. Having regard to the profound alteration in their

subject-matter, Drs. Porter and Fenton gave consideration also to the problem whether or not to retain the original question and answer form. In the end they decided to make no change in this particular, but to put the new wine into the old bottles. Hence it comes that, while in some places a two-line question is briefly answered in an apt paragraph, in others the fit is not so neat. In one instance an apparently innocent question looses a flood of information which has somehow overflowed its container, as it runs on for ten pages. Such inequalities are, however, inherent in the system, and it must be admitted that, if ever the question and answer method is to be commended at all, it is precisely in such a case as this, where the effort is made to present the law to the public health student. He almost invariably views the subject with sincere and outspoken distaste, and is prepared to welcome any device which can impart even a mild degree of liveliness to beguile the tedium. In the essentials the book is sound and can be cordially recommended to those to whom it is addressed.

INTRODUCTION TO DERMATOLOGY

Gardiner's Handbook of Skin Diseases. Revised by John Kinnear, M.D., M.R.C.P. Fourth edition. (Pp. 239; 70 figures; 16 coloured plates, including a frontispiece. 10s. 6d. net, postage 6d.) Edinburgh: E. and S. Livingstone. 1939.

We are glad to notice that this useful introduction to dermatology, the first three editions of which were written by Dr. Gardiner, whose early death was a great loss to dermatology in Scotland, has been revised and brought up to date by Dr. Kinnear. In its concentration on essentials and avoidance of rarities which are seldom, if ever, seen in ordinary practice, this book is one of the best and most helpful to put into the hands of students and general practitioners, and Dr. Kinnear has whole-heartedly accepted the precepts laid down by his predecessor. Under his skilful pruning-knife the volume has actually shrunk in dimensions; in fact the fourth edition is thirty pages shorter than the third. This is quite contrary to the usual custom of textbooks, which are prone to swell in successive editions, and prompted us to seek a reason. We found it in the fact that there are thirty-four lines to the page instead of twenty-nine, so that really there is probably a little more matter in the volume before us than in its predecessor. In any case there is no superfluous padding. Although a small volume, it possesses no fewer than sixteen coloured plates, five of which are by the Dufay colour process, which will no doubt be a great attraction to many readers, and on the whole they are successful examples of colour photography. The monochrome pictures are also quite good, and there are several diagrams which are very helpful in explaining the pathology of certain skin conditions.

"GRAINS AND SCRUPLES"

Doctors in Shirt Sleeves. Musings on Hobbies, Meals, Patients, Sport and Philosophy. Edited by Sir Henry Bashford. (Pp. 294. 10s. 6d. net.) London: Kegan Paul, Trench, Trubner and Co. 1939.

Our contemporary the *Lancet* for many months past has published a series of unsigned articles under the title "Grains and Scruples." They have been looked forward to with eagerness, for they were well and wittily written and were read with much interest by both laymen and doctors. It was therefore worth while to gather some of them together, strip them of their anonymity, and publish them under the title of *Doctors in Shirt Sleeves.* Sir Henry H. Bashford, chief medical officer to the General Post Office, edits the volume and introduces it with a pleasant preface. The component essays are written by various hands. Graduates of Oxford, Cambridge, London, and Durham, Fellows of the Royal Colleges, and family practitioners are the contributors. Each has taken his own line, but all show themselves as men of culture and literary artists. Some of the articles are reminiscent of those contributed to the original *Spectator* by Steele and Addison; others deal with more modern subjects. The book is not meant to be read at a single sitting. It should be opened at random, and will always be found to contain food for thought.

CLINICAL PATHOLOGY

Clinical Laboratory Methods and Diagnosis. A Textbook on Laboratory Procedures, with their Interpretation. By R. B. H. Gradwohl, M.D. Second edition. (Pp. 1,607; 492 figures; 44 coloured plates, including a frontispiece. 50s. net.) London: Henry Kimpton. 1938.

Clinical Pathology. By P. N. Panton, M.A., M.B., and J. R. Marrack, M.A., M.D. Fourth edition. (Pp. 502; 50 figures; 12 plates, 10 of which are coloured. 16s.) London: J. and A. Churchill. 1939.

It is expected of the clinical pathologist that he should be at least proficient in four distinct branches of medical science: morbid anatomy and histology, microbiology, biochemistry, and haematology. The really profound study of all these is beyond the capacity of any one busy man, and textbooks of clinical pathology must therefore be somewhat superficial in their outlook, and should perhaps preferably be limited in their scope and intentions, leaving books on each of the four basic subjects concerned, and perhaps others, to serve as works of reference. Dr. R. B. H. Gradwohl's *Clinical Laboratory Methods and Diagnosis*, which must be the largest work of its kind ever produced, seems to be intended as a compendium of all that the clinical pathologist need ever know. Its vast size is due to the fullness of the practical instructions given, the lavish use of illustrations, careless writing with frequent repetition, and the inclusion of chapters on more or less extraneous subjects such as toxicology and the detection of crime by laboratory methods. There can surely be no other work which deals with all such various matters as, for example, the culture of sterile maggots for wound treatment, "semen appraisal," the determination of cystin in finger-nails, the "bacteriological examination of glassware and china for sanitary quality," firearms identification, and taking finger-prints from corpses. No fewer than sixteen pages in the chapter on parasitology are devoted to the black widow spider; this section makes entertaining reading, but is so repetitive that it could be condensed to half its length. In the more commonplace parts of the book the description of multiple methods for the sake of completeness is sometimes misleading: it is not always clear which of them is to be preferred, and the tyro reading the section on amoebic dysentery, for instance, with details of methods for staining and even cultivating the amoeba, will not understand that it can best be demonstrated in a simple wet film of a piece of mucus. In spite of these faults, and of the impossible magnitude of its aim, this book is a monumental achievement, and will be found useful in a variety of ways.

Dr. P. N. Panton and Professor J. R. Marrack's *Clinical Pathology*, which has now appeared in its fourth edition, occupies an established place as a guide to the application of laboratory methods in medicine. Theory, practice, and interpretation are nicely balanced in the simple accounts

given of common procedures and their uses. While it represents what the student need know of practical clinical pathology, and is perhaps the most useful of the medium-sized bench books for those doing such work, he should realize that it does not contain all that he need know of the fundamental sciences on which clinical pathology is based. The chapters on immunity, on micro-organisms (including viruses), and on morbid histology might give a false impression of this kind, and while some of this material is necessary as a background to the rest of the text some of it might perhaps be omitted without loss to the practical purpose of the book, and a corresponding gain both in space for the description of methods and in clearness of intention. The chief new feature in this edition is a short chapter on tests for pregnancy.

Notes on Books

On December 31, 1938, we welcomed the publication of a new and revised edition of Part I of the catalogue of Lewis's Medical and Scientific Library, Gower Street, London, W.C., containing a list of authors and titles of books. Part II, being a classified index of subjects, with names of authors who have written upon them, has now appeared as a smaller companion volume. The preface gives a table of approximate sizes in inches of books listed in the main catalogue under various subdivisions of the terms royal, demy, crown, etc., in accordance with publishers' usage. As in the last edition of Part II, the initials of authors have been added to facilitate reference to the body of the catalogue, with the year of publication, and more often than formerly a word or two has been added to each item to indicate the nature and scope of the book. For full titles reference must be made to Part I. The price of the catalogue complete (Parts I and II) is 16s. net (to subscribers 8s.). Those who have already bought Part I may receive Part II free of charge on application to Messrs. H. K. Lewis.

The 1939 edition of the *Municipal Year Book* is the largest since the volume was founded in 1897. It comprises 1,754 pages, divided into fifty-five sections, which cover the most important branches of civic administration, and has full general indexes with a useful thumb-index to the twelve main divisions. The whole material has been thoroughly revised; there is a comprehensive review of local government during the past year, a survey of recent legislation, and details of latest developments in the civic services. The Minister of Health contributes a general preface to the volume, and the Minister of Transport writes a foreword to the roads and transport sections. It is published by the Municipal Journal, Ltd., 3 and 4, Clement's Inn, Strand, London, W.C.2, at 35s. net.

The National Nutrition Conference, held recently in the B.M.A. House, brought again into prominence the important relations of agriculture to the health of human beings, both in regard to the kind of foodstuffs consumed and the manner of their production. Professor ARTTURI VIRTANEN'S book on *Cattle Fodder and Human Nutrition* (Cambridge University Press, 7s. 6d.) serves to underline these relations. It shows that by the application of new methods of farming, both in the cultivation of green crops and their harvesting for fodder, the normal diet of the people of Finland may be made adequate at the source, winter and summer alike, without the expense of supplementary foods or the difficulty of reforming the dietary habits of the people. Though it is based on research material obtained in Finland and applies in particular to that country it has an important message to convey to agriculturists and public health authorities in this country also. Those interested in the relation of agriculture to health will do well to study it.

Pharmacie Galénique, by A. GORIS and A. LIOT, is a work in two large volumes of 1,000 pages each. The authors are respectively a professor of pharmacy and the chief pharmacist of the central pharmacy of the Paris hospitals. The first chapters contain a history of pharmacy and a description of pharmaceutical methods, while the remainder of the work provides a systematic account of the pharmaceutical properties of all the galenical preparations in common use in French medicine. About one-quarter of the second volume is devoted to ferments, organotherapy, vaccines, and sera, and these sections include descriptions of the chief methods of biological assay. These notes indicate the wide range of the subjects covered in this work. The authors explain that it is based on the course of lectures given to students of pharmacy. The volumes provide a general review not only of pharmacy but also of a number of allied subjects. They are published in Paris at 390 fr. (bound, 450 fr.) by Masson et Cie.

Preparations and Appliances

HYDROSTATIC BREAST PUMP

Dr. A. S. WOOLSTONE writes from the City of London Maternity Hospital:

I was struck by the manifold conditions which can be successfully treated with the electric breast pump. It is considered that the use of the pump has been a factor in considerably reducing the number of cases of breast abscess in this hospital, which nurses some 2,000 mothers every year.

However, the initial high cost of the apparatus has no doubt prevented it being used extensively in smaller institutions, nursing homes, or by midwives. I have therefore designed the apparatus here illustrated. Briefly, it consists of a Sprengel's pump, which can be fitted to almost any tap, a 6-ft. length of tubing, and a milk-collecting bottle. The bottle is of a simple open-necked type, holding 2½ oz., and to it is fitted a rubber stopper with two perforations. Into one of these a breast shield is fitted, and into the other a right-angled connexion with an aperture at the point marked "A" on the illustration. The free end of this angled connexion is attached by means of the rubber tubing to the Sprengel pump, as shown in the second illustration.

With the pump in action, the shield applied to the breast, and a finger placed over the hole A, negative pressure is obtained and milk is drawn into the bottle. By removing the finger from the hole the vacuum is released. Therefore by covering and uncovering the aperture an intermittent sucking action is obtained. The apparatus has the advantage of being very easily used by the patient herself after brief instruction, and there is no danger of too powerful suction, as she will naturally release the vacuum should it become too great. In addition to this its portability, absence of parts to go wrong, and its efficiency make it attractive. The price complete, as supplied by Messrs. Down Bros., Ltd., is 27s. 6d.

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THE HOSPITAL MAP OF ENGLAND AND WALES

The usual statistical review of the position of the voluntary hospital is given with a fullness to satisfy the most exacting statistician in *The Hospitals Year-Book, 1939*.[1] It includes also a directory of hospitals which is compiled in a very useful way. One of the outstanding questions dealt with in this new edition is—to use a clumsy word—the regionalization of the country's hospital service, plans for which have been prepared by the provisional central committee set up by the British Hospitals Association to carry the recommendations of the Sankey Commission into effect. Mr. R. H. P. Orde, the editor of the *Year-Book*, has an article on the subject which he was unable to complete before himself entering hospital for a (happily satisfactory) operation. As Mr. Orde points out, in a community which seeks to guarantee, whether through voluntary or local authority institutions, a standard of hospital accommodation and treatment for all its citizens, it is a thing not to be tolerated that the individual's chance of receiving such services should depend upon the accident of his place of residence. Regionalization means nothing more than an ordered plan to ensure to all the people of this country, no matter in what part of it they live, facilities for institutional and specialist treatment within a reasonable distance of their homes. But maps are stubborn things, and a glance at the map of England and Wales will show how difficult this problem can be. The boundaries of any hospital region are hardly likely to coincide with the boundaries of administrative or other areas. Regard must be paid to physical features, railway communications, the accidental location of the hospitals themselves, and local custom and tradition. How potent this last factor may be is illustrated by Mr. Orde's remark that the mere suggestion—quite unauthorized—that the boundary between England and Scotland might be overlapped led to a protest worthy of the Border.

In putting the recommendations of the Sankey Commission literally on the map the Council has partitioned England and Wales into twelve divisions. Each division will be further split up into two or more regions, and perhaps subregions, as the existing groups of hospitals may dictate. A number of hospitals in a given region might not be able, for example, singly to maintain a consultant physician or surgeon, but as a group they may well be able to do so, and thus their potential patients will not be left dependent for specialist service upon a centre at any great distance. The marking out of divisions is sometimes easy. The promontory of Devon and Cornwall forms a natural division; so does East Anglia, to which the county of Huntingdon and a part of Essex have been added. But at the recent Public Health Congress held in London, during a discussion on this subject, Sir Henry Brackenbury pointed out some difficulties. Take the North of England, for example. The counties of Northumberland and Durham form a division, but to this division are added Middlesbrough and certain rural parts of the North Riding of Yorkshire, which naturally look to Newcastle for their hospital and specialist services. But what will the North Riding County Council have to say about that, and how will the finance be adjusted when the Ministry of Health gives its block grants to the North Riding for health services? Derbyshire, again, for institutional and specialist services is divided in such a way that part of it looks to its own county town and other parts to Nottingham, Manchester, and Sheffield. Wiltshire, according to the provisional arrangement, is cut into three, one part looking to Bristol, another to Oxford, and the third to Salisbury. The division in which London is placed includes Middlesex and Surrey and Kent, but not Berkshire or Buckinghamshire. The regions for hospital services, it is plain, must be largely independent of the actual local government areas from which the present county councils and county borough councils are formed.

The intention is that in each division there shall be so complete a hospital service that no resident will be required to travel outside its borders, except at his own desire, for treatment recognized as within the competence of a modern general practitioner and consultant. To put it in another way, no part of any division should be a "distressed area" so far as hospital services are concerned. The principal value of the arrangement would lie in a co-ordinated distribution of specialist services. Another advantage might well be the introduction of a bed register, whereby a practitioner who could not get a patient into his ordinary hospital would be able to find a bed in another, perhaps at a little distance. The question is surrounded by formidable difficulties, but in the matter of hospital and health services greater difficulties have been faced and overcome.

[1] Central Bureau of Hospital Information, 12, Grosvenor Crescent, London, S.W.1.

The *Year-Book* again testifies to the general healthiness of voluntary hospitals. During 1937 the number of voluntary hospital beds in Great Britain increased by over 2,500, the number of in-patients reached the record figure of 1,387,000, and the number of out-patients 6,421,000. One-third of the out-patients were treated at the forty-two hospitals associated with medical schools. The larger voluntary hospitals were occupied almost to the level of available beds. The average number of beds occupied daily was 87.7 per cent. of the total. The stream of voluntary giving also showed no slackening in 1937. In London, in Scotland, and in Ireland the total amount received as voluntary gifts increased, and if there was some decline in the figure for the English provinces it is merely because some forty fewer hospitals sent in their details. But 1937 was comparatively a non-crisis year. We must await the next *Year-Book* to learn whether, and if so to what extent, the international situation affected that part of hospital income—less than one-quarter of the total—which is set down as voluntary gifts.

OPTIC ATROPHY

The problem of optic atrophy in tabes presents two considerable difficulties. Neither the exact pathology of the lesion nor any satisfactory treatment is known. It has been held that the optic atrophy is secondary to degeneration of the ganglion cells in the retina, though the usual view is that the nerve fibres themselves are affected. As the spirochaete has not been found in either the retina or the optic nerve it is a moot point whether atrophy is the consequence of the immediate action of syphilis on the eye. That an indirect relation exists no one disputes, but the absence of any decided therapeutic effect from anti-syphilitic treatment is in itself an argument against tabetic optic atrophy being a direct result of syphilis. In fact it appears that anti-syphilitic treatment makes matters worse in a large number of cases, so much so that many clinicians consider the arsphenamides contraindicated in the presence of tabetic optic atrophy.

A new approach to the problem has been made by Sobanski, Lauber, and others of Warsaw by the application of ophthalmodynamometry. They have brought forward evidence, ably marshalled by Lauber[1] at the Oxford Ophthalmological Congress last year, to prove that the deciding factor in optic atrophy is a disproportion between the intraocular tension and the pressure in the retinal arteries. A low retinal pressure in relation to the intraocular tension favours the exsanguination of the retina and optic nerve during the diastolic period of the retinal circulation. This intermittent exsanguination would, according to these observers, explain the progressive character of optic atrophy in tabes, for they hold that most tabetics with optic atrophy have a low blood pressure and that some syphilitic complications of the vascular system induce vascular hypotension. They also hold that glaucoma or a relative increase of intraocular tension in such patients has a disastrous influence on the course of the atrophy, and that glaucomatous optic atrophy is likewise unfavourably influenced by general hypotension. That this is not mere conjecture is obvious from the mass of clinical observations adduced for their thesis, and from the results they give of the effect of treatment undertaken on these principles. Thus in the treatment of tabetic optic atrophy they aim at reducing the intraocular tension by the use of miotics or by cyclodialysis. They also treat the general condition of the patient on lines calculated to raise the general blood pressure. It must, however, be pointed out that almost every point of the argument has been contested by different observers, in particular by Albrich and Kukán,[2] Ascher,[3] and Horniker,[4] though support has also come from no less reputable observers. What is of particular interest in this approach to the problem of optic atrophy is that it reopens an old issue as to the significance of intraocular tension in such degenerative affections as retinitis pigmentosa. On the assumption that depriving the retinal vessels of their contracting sympathetic nerve fibres would supply the retina with a better nutrition, operations on the sympathetic trunk in the neck were undertaken some years ago, after Hunter and Royle's work on the subject had stimulated interest in a procedure that had been tentatively applied earlier. Similarly, trephining had been done on the eye in the hope that the lowered intraocular tension would induce dilatation of the retinal arteries. To this approach the new work on tabetic optic atrophy lends support.

That other factors besides the purely vascular are of significance in at least some forms of retinal and optic atrophy is shown by the recent reports on optic neuritis and optic atrophy in cases of pernicious anaemia (Henry Cohen,[5] Talbot[6]), and by the experimental observations of J. P. Jensen.[7] For many years it has been known that resection of the whole or the greater part of the stomach

[1] *Trans. Ophth. Soc. U.K.*, 1938, **58**, Part II, 661.

[2] *Klin. Mbl. Augenheilk.*, 1938, **100**, 545.
[3] Ibid., 1937, **98**, 398.
[4] *Atti Congr. Soc. Ital. Oftal.*, 1937, 34.
[5] *Lancet*, 1936, **2**, 1202.
[6] *Brit. J. Ophthal.*, 1936, **20**, 619.
[7] *Acta Ophthal.*, 1938, **16**, 649.

may give a blood picture simulating that of pernicious anaemia. More recently Petri and his collaborators have demonstrated that after resection of the stomach and of the Brunner glands of the duodenum in young dogs a blood picture simulating that of a severe anaemia of the hypochromic type, together with symptoms resembling pellagra, was obtained. Histologically extensive degeneration of the whole central nervous system was present. Jensen made a study of the eyes removed from such experimental animals, as it was noted that they appeared to be blind. He found extensive changes in the retina—most pronounced in the animals which survived longest. The ganglion cells were disorganized throughout, and in the optic nerves a proliferation of glia could be found along the septa. There was also extensive demyelinization. These changes are like those observed in the rest of the central nervous system. Jensen argues that the symptoms must be ascribed to the lack of a factor normally present in gastric juice, for administration of anti-pellagra vitamins did not help, but marked improvement followed when the experimental animals were given gastric juice. He also draws attention to the cases reported by Wagner and by Weir indicating the improvement that occurs on the cessation of vomiting in patients in whom optic neuritis is associated with protracted post-operative vomiting or with hyperemesis gravidarum, as noted by Berwitz and Lufkins. These clinical observations, he holds, emphasize still further that the metabolism of the retina and optic nerve requires a factor normally present in the gastric juice.

THE TELLURITE TEST

A simple test applicable at the bedside by which diphtheria can be diagnosed in ten minutes sounds too good to be true, and the claim to have devised such a test made by Manzullo, to which we referred recently,[1] obviously required confirmation. His method consists in applying a 2 per cent. solution of potassium tellurite to the throat and looking for blackening of the affected area five or ten minutes later. Potassium tellurite has long been in use as a constituent of selective media for cultivating diphtheria bacilli, and their colonies on such media are black, this appearance and their capacity for growth in the presence of a highly toxic substance both being due to their power of reducing it. It occurred to Manzullo that this reducing action might be exerted forthwith in material such as diphtheritic membrane in which diphtheria bacilli had already grown in abundance, and he proved to be right. Proceeding to use the application of potassium tellurite solution to the throat as a means of immediate diagnosis in diphtheria, he claimed to obtain almost perfect correlation with the results of ordinary bacteriological diagnosis by culture. Anyone who has used tellurite media knows that not only virulent but avirulent diphtheria bacilli, certain diphtheroids, and even a few other species of bacteria will grow on them and produce black colonies; it is too much to expect that the presence of these indifferent bacteria in a membrane should not cause blackening and hence a false positive result. That this is indeed one drawback of the method is clear from two series of observations on it described at pages 1273 and 1275 of our present issue. Dr. Eric Tomlin not only obtained a large proportion of positive results in non-diphtheritic cases but showed, by applying potassium tellurite solution to primary cultures from such cases, that they contained bacteria capable of reducing this substance with consequent blackening. In his hands, however, the test never erred in the opposite direction, and the fact that it never gave a negative result in a genuine case of diphtheria might be said to leave it with at least half, if not more, of the original value claimed for it by Manzullo. Unfortunately this was not the experience of Drs. J. B. L. Tombleson and R. M. Campbell, who obtained not only false positive results in nearly half of their non-diphtheritic cases but false negative results in no fewer than twenty-four out of 153 cases of diphtheria, some of them severe with extensive membrane. The explanation of this is not clear, although there is some suggestion that variation in the reducing power of different types or strains of diphtheria bacilli may be concerned in it. According to these results, reliance on the tellurite test would deprive one case in six of necessary immediate serum treatment and lead to the unnecessary administration of serum to nearly 50 per cent. of non-diphtheritic cases. Its value is therefore strictly limited, unless it can be so modified as to yield better results. Further experience may well show that it is least dependable in just those cases in which the diagnosis is most in doubt on other grounds; a condition which is atypical in one way is frequently so in others. For the time being it may confidently be said that the early diagnosis of diphtheria must still be primarily clinical, and that antitoxin should never be withheld in any really suspicious case pending laboratory investigation.

[1] *British Medical Journal*, 1938, **2**, 1152.

THE PHARYNGEAL PITUITARY

It is well known that small accessory nodules of various tissues, particularly endocrine, are often encountered in the body. As a rule they tend to occur along the course followed by the parent gland during its developmental migration. It is rather curious, therefore, that the possibility of finding similar aberrant fragments of pituitary tissue has been relatively neglected. The anterior lobe of the pituitary gland is derived originally from an outgrowth of the epithelium of the posterior nasopharynx. This epithelial outgrowth migrates upwards towards the base of the brain, and, losing its attachment to the pharynx, finally establishes itself in the region later to become the sella turcica. In doing so it passes through tissues that will later become the sphenoid bone, and this course accounts for the fact that small fragments of pituitary tissue are occasionally met with in the body of the sphenoid bone itself. But pituitary

tissue is more often to be found in the pharyngeal wall at a point corresponding to that from which the embryonic outgrowth originally developed. In an unselected series of fifty-four human necropsies recently studied by means of serial sections pituitary tissue was observed in the mucosa of the nasopharynx in fifty-one.[1] Generally it appeared as a single, well-circumscribed, and encapsulated structure. It is small, the largest mass having a volume of less than three cubic millimetres, but it occurs often enough to earn the name of "pharyngeal pituitary." Histologically it consists partly of undifferentiated epithelial cells and partly of differentiated cells similar to those in the anterior lobe. Acidophil and basophil cells, however, are usually present in greatly diminished numbers, and may indeed be absent. The histological changes in the pharyngeal pituitary found in a small series of endocrine disorders did not follow those to be expected in the pituitary gland itself. For instance, no "pregnancy cells" could be discovered in the pharyngeal pituitary of a woman who died sixteen hours after delivery at full term. It must be concluded that the pharyngeal pituitary, though not uncommon, is a vestigial structure not subject to the same controlling influence as the pituitary gland itself, and probably only rarely exerting any comparable hormonal activity. So far as is at present known, therefore, the pharyngeal pituitary must be regarded as an anatomical curiosity of no functional importance, yet almost always to be found if sought for with sufficient diligence.

[1] *Amer. J. Path.*, 1938, **14**, 763.

INFECTIOUS ABORTION IN MAN

The majority of bacteria which are pathogenic for animals as well as man produce similar lesions and effects in both. To this rule the genus *Brucella* seems at first sight to be an exception; the recurrent bouts of incapacitating fever which are the only prominent feature of infection in the human being differ radically from its effects in animals, of which the only striking manifestation is abortion. This is a frequent result of infection by *Br. abortus* in cows, and is followed by what may be a long period of latent infection during which the organism is excreted in the milk. Abortion is also produced in the goat by *Br. melitensis*, although in herds where the infection has long been endemic it may produce little or no effect, in spite of persisting throughout the animal's life. There is a clear contrast between the typhoid-like condition produced in severe cases in man, the physical basis of which is a diffuse infection of the spleen, liver, and abdominal lymphatic glands, and the predilection for the gravid uterus and the udder exhibited in the cow and goat. It would be more in accord with the consistent behaviour of other bacteria in a variety of hosts if *Brucella* caused abortion also in man, and, in fact, this does occasionally occur—as does its excretion in human milk. The mere occurrence of abortion in a woman suffering from undulant fever is of course not proof of its cause, and cases fully authenticated by all the bacteriological examinations needed for this purpose are very rarely reported. Such a case is that of M. Janbon and J. C. de Kerleau[1] of Montpellier, the centre of a district in Southern France where undulant fever is rife. Their patient was a woman of 34, nine of whose ten previous pregnancies had gone to term, who aborted at the third month during an attack of undulant fever due to *Br. melitensis*. This organism was recovered from her blood, from the placenta—sections of which showed acute inflammatory changes, with oedema and necrosis—and from the blood, spleen, and gastric contents of the foetus. It was also found in abundance in the lochia, from which, however, it disappeared within a few days. According to the authors this is the first case of abortion in a woman which has been proved to be due to *Br. melitensis*; the few others in which the evidence can be accepted were due to *Br. abortus*. Although only a curiosity, it serves to illustrate the close relation in pathogenic behaviour between these two organisms, which until fairly recent times was unsuspected.

[1] *Presse méd.*, 1939, **47**, 453.

SPASM OF CEREBRAL ARTERIES

There is much dispute about the part played by cerebral arterial spasm in symptomatology. It is invoked chiefly to explain the occurrence of transient disturbances of cerebral function in hypertension—so-called hypertensive encephalopathy or hypertensive cerebral attacks—because in certain instances no lesion is found in the arteries of the brain at necropsy and because the attacks are frequently preceded by an acute rise of blood pressure. Although this explanation is attractive in its simplicity it is difficult to reconcile with the experience of physiologists, who have often demonstrated that the cerebral arteries contract unusually weakly to the better-known vasoconstrictor agents. Thus, persistent research failed to reveal any vasomotor innervation of these vessels until Forbes[2] perfected the method of observing the surface of the brain through a glass window screwed into the skull. With this technique he and Wolff[3] demonstrated that the pial arteries constrict when the cervical sympathetic is stimulated or when adrenaline is directly applied to them. But the constriction of the pial arteries is minute as compared with that of the arteries of the ear on cervical sympathetic stimulation; when adrenaline is injected intravenously the arteries of the ear constrict vigorously while those of the brain are passively dilated by the rise in blood pressure.[4] In view of these findings, which are in harmony with the relatively poor development of the muscular coat in the cerebral arteries, the occurrence of spasm in them may be doubted; but that the vessels may react more strongly to other agents has not been excluded, and it may be recalled that Florey[5] has demonstrated contraction of the pial arteries in response to direct mechanical stimulation. Villeret and Cachera[6] have recently observed the pial vessels of dogs, using Forbes's technique, one to 123 days after powdered glass wool emboli had been introduced into the internal carotid

[2] *Arch. Neurol. Psychiat.*, Chicago, 1928, **19**, 751.
[3] Ibid., 1057.
[4] Ibid., 1933, **30**, 957.
[5] *Brain*, 1925, **48**, 43.
[6] *Presse méd.*, 1939, **47**, 267.

artery. In some instances the window was inserted over an occluded vessel in which the flow had been stopped. In others, dilatation of the arteriolar network was observed. Localized arteriolar constrictions were seen in nine of eighteen dogs. These constrictions were not seen until twenty to thirty minutes after applying the window and were transient, segments of vessels constricting for a short time and then dilating. The occurrence of these constrictions was not related to the incidence of infarcts or to neurological signs, or to the length of time elapsing since the emboli were introduced. Unfortunately no information is given as to the frequency with which such constrictions may be seen in animals not subjected to embolism. These observations were prompted by the conception current in France that many of the phenomena of embolism are due to arterial spasm, but it cannot be said that they shed any clear light on this problem.

TRANSIENT ALLERGIC LUNG CHANGES

Some years ago Löffler described a condition in children which he termed transient pulmonary infiltration with blood-eosinophilia. Later, Engel of Shanghai dealt with something similar which he called allergic oedema of the lungs. In a recent number of the *Archives of Disease in Childhood*[1] Söderling of Stockholm describes several other examples of this curious condition and reviews the literature. Typically, a child, often with a history of repeated bronchitis with asthma, is found on *x*-ray examination to have a large area of diminished translucency in one of the lung fields. Associated with this there is a low-grade pyrexia and usually some eosinophilia in the blood. The lung condition is transient and, in fact, within a few days the shadow seen radiologically has usually disappeared. In the cases described by Söderling the lung changes were discovered largely by chance. The degree of eosinophilia was variable, and Söderling holds that it is not essential for the diagnosis. He raises the question of eosinophilia in the sputum; in one of his cases a definite but transient increase in eosinophil cells in the sputum was noted. The differential diagnosis is obviously difficult at the time when the shadow in the radiograph is first observed, but easy when such a shadow is found to disappear so quickly. Söderling maintains, too, that there should be a history of allergy of some sort. F. Parkes Weber has also described a case[2] in a boy aged 10 with a history of "running from the nose and eyes." A radiograph showed an opacity in the right lower lobe which disappeared within approximately three weeks. Incidentally, this is a much longer time than in Söderling's cases. Examination of the boy's blood, however, showed a definite eosinophilia and he never appeared ill. The question as to whether this is an example of Löffler's syndrome is discussed, and the possible diagnosis of pneumonitis, suggested by Morton Gill[3] for other forms of transient pulmonary infiltration, is rejected. It is clear that this allergic lung condition—as also pneumonitis—is a special syndrome extracted from the rubbish heap labelled "abortive pneumonia." Further study is required before the exact part played by allergy can be understood, but meanwhile it is of interest that the two British journals dealing with children's diseases should have published accounts of Löffler's syndrome during the same month.

[1] *Arch. Dis. Childh.*, 1939, **14**, 22.
[2] *Brit. J. Child. Dis.*, 1939, **36**, 15.
[3] *British Medical Journal*, 1938, **1**, 504.

PRINCIPLES FOR STUDIES ON NUTRITION

The Health Organization of the League of Nations has published a handbook entitled *Guiding Principles for Studies on the Nutrition of Populations*[1] by Professor E. J. Bigwood of Brussels University. The author has endeavoured to work out sound methods of inquiry which can be generally applied to the actual food consumption and the state of nutrition of given population groups. All experienced workers in this field know that the findings of investigators ought to be presented in such a way as to facilitate comparison. Standardization of methods need not interfere with originality of research. The handbook is divided into two parts, the first dealing with dietary surveys and the second with inquiries into the state of nutrition of populations. There are four types of dietary survey: investigations may extend over a whole country, or be limited to population groups, to families, or to individuals. The author explains the technique of these surveys: the weighing method, the household account-book method, and the collection of data by means of questionaries. He then describes the analysis of the collected data from the standpoint of the physiology of nutrition and the scales of family consumption coefficients which have to be used in comparing the results of inquiries concerned with groups of different age and sex composition. The last two chapters of Part I are devoted to the economic value of foodstuffs and diets and the statistical significance to be assigned to the results of surveys. In Part II Professor Bigwood discusses the somatometric (biometric, clinical, and physiological) methods that may be suitably employed in these investigations. He pays special attention to the physiological methods, particularly those for detecting latent hypovitaminoses and iron deficiency. The handbook is completed by examples of surveys of various types in a number of different countries; it also includes a terminological index and bibliographical references.

[1] Ser. L. o. N. P. 1939.III.1. Price 6s. Sole agents for publications of the League of Nations in Great Britain, Northern Ireland, and the Crown Colonies: George Allen and Unwin, Ltd., 40, Museum Street, London, W.C.1.

A prize of 7,500 dollars has been awarded to five workers in the Research Institute of the Royal Cancer Hospital, London, by the trustees of the Anna Fuller Fund, New Haven, Connecticut, for "a real and outstanding contribution to knowledge on the subject of the cause, care, prevention, or cure of cancer" since March, 1932. The recipients are Professor E. L. Kennaway, M.D., F.R.S., director of the Institute, Professor J. W. Cook, D.Sc., F.R.S. (who was awarded jointly with Professor Kennaway the prize of the International Union against Cancer in 1936), Mr. Colin Leslie Hewett, Mr. Izrael Hieger, and Mr. William Valentine Maynford.

WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

INJURIES OF THE LOWER LIMB—II

BY

ST. J. D. BUXTON, M.B., B.S., F.R.C.S.

Fractured Femur

In 1917 Martin and Petrie made some valuable observations with regard to infection of bones due to gunshot wounds. Their conclusions can be briefly summarized as follows:

1. From the surface of a divided or fractured bone exposed to infection bacteria may penetrate to deeper parts.

2. In an untreated fracture penetration is apparently unlimited.

3. If the dead bone on the surface of the fracture is removed early penetration is much reduced, and may not occur at all.

4. Penetration, particularly of anaerobes, is greatly increased by reduction of the circulation through the injured bone.

5. Penetration is increased by obstruction to drainage either of the bone or of the soft parts.

6. The order of frequency and power of penetration of the bacteria found is: (*a*) streptococcus, (*b*) staphylococcus, (*c*) anaerobes, (*d*) *B. coli*.

7. The rate of penetration is at its maximum during the first few days.

8. Bruising—an invariable accompaniment of projectile fracture—does not appear to facilitate penetration if the surface layer of debris is removed and drainage established.

9. In a septic fissure growth of bacteria is progressive and may lead to infection of a distant part—for example, a joint. Dissemination of infection throughout a bone takes place by penetration from the walls. Little beyond the consideration of these findings in relation to thigh wounds will be necessary to understand why gunshot wounds of the thigh were a menace during the war.

Efficient drainage was invariably made difficult by the laceration of the muscles in addition. Many patients arrived at the operative centre in a condition of shock, owing to the extent of the wound or multiple wounds. The employment of the Thomas splint as a first-aid measure in these cases is to be encouraged.

The treatment of a gunshot wound of the thigh with fracture of the femur consists of: (1) The operative treatment of the wound and fracture, which has been described. Anti-shock treatment before operation will generally be necessary. (2) Reduction. (3) Immobilization.

REDUCTION AND IMMOBILIZATION

This is almost invariably realized when the "operation" is over, or at least it is facilitated. Often it consists in immobilizing the limb in the physiologically correct position: in any case, prolonged extension always gives the result desired. In post-war surgery it was not osteotomy for angulation that was necessary, but sequestrectomy for necrosed bone or grafting for non-union. Gradual reduction by weight extension is always desirable; and before discussing the technique it is not out of place to point out that any method of forcible reduction by stripping periosteum, the use of large bone-holding forceps, and internal fixation by chandlery-bolts, screws, plates, etc., is likely to be followed by disastrous complications.

British surgeons employed Thomas's splints, when possible, and a weight or fixed extension applied to the skin by adhesive strapping or a non-irritating glue. Laced boots and plaster gaiters had a trial. Transfixion nails and metallic loops—the latter passing between the tendo Achillis and tendons at the back of the ankle—were employed by the Italians and French. In fact, skeletal traction was first advised by an Italian physician. The British method produced reduction and caused no complication, unless it was over-traction in some cases; but frequent soiling of the plaster was inevitable and constant renewals became necessary. Apparatus around the ankle became more popular, and the footpiece glued to the foot, devised by Sinclair, had many advantages. The "glue" consists of 50 parts ordinary glue, 50 parts water, 2 parts glycerin, 2 parts calcium chloride, and 1 part thymol. The mixture is sterilized. It can be used for extension bands by applying gauze strips after painting the skin with glue, or to fix a wooden footpiece to the skin. This is mentioned in some detail, for many surgeons doubt the advisability, and possibility, of using Steinmann's pins or Kirschner's wires, which are familiar to all now, in every case of gunshot wounds of thigh or leg. That they would be used extensively there is little doubt, but with what success cannot be foretold.

SPLINTAGE

During the great war the standard splint for large flesh wounds of the thigh, with or without fracture of the femur, was the Thomas. It is often convenient to bend the side irons at the level of the fracture or the knee. In theory this does away with the exact method of extension, but as a means of fixing the fracture and accessibility for dressing it has no superior. Fixed extension will be used in transport, and in some cases in hospital. Weight extension can be employed by one of the two recognized methods. Slings are probably better fixed by large safety-pins than by the simple clip, which is inclined to slip. The latest clip is not likely to be available in large quantity. In certain cases of multiple wounds the splint is used only as a supporting trough. The Hodgen splint is still used by some surgeons.

In severe injuries the limb can be slung from an over-bed beam, after the original method, described as the Balkan beam. In hospitals away from the line apparatus to sling the Thomas splint, such as beams with pulleys or Pearson's fracture bed, is available. The latter can be used in a number of ways, with or without a mattress; the limb can be extended without splinting, if necessary, and the back of the limb can be dressed from below.

Fractured Leg

Treatment for wounds of the leg is on the same lines as that of the femur. Plaster-of-Paris is to be avoided during early treatment, but may be suitable in slight cases after a few weeks. In the early stages the extent of swelling subsequent to the operative treatment cannot be

gauged. It is likely that skeletal traction will be used by pin traction through the os calcis, particularly as it has met with such success in open fractures during the last twenty years. Over-traction by too great a weight will lead to separation of the fragments, which is to be avoided. The non-union of the tibia seen after the last war necessitated many bone grafts, and their number will be multiplied unless thought is given to this matter when skeletal traction is employed.

The question of secondary suture of leg wounds does not apply as in open fractures due to road accidents. Braun's frame is the ideal for these fractures rather than Thomas's splint. It is in frequent use now, and everyone who may be called upon to do this work should become familiar with it.

Injuries of the Foot

Conservative treatment should be employed as far as possible. Incisions on the sole of the foot may be necessary, but should be avoided. Amputation of toes that are only adherent or are gangrenous may be required. Those through the middle of the foot at the site of a wound are not likely to succeed, as infection spreads up the tendon sheaths. For urgent surgery an amputation through the lower third of the leg is advocated for severe injuries of the foot. This may be a useful stump, and if reamputation is necessary later the standard leg amputation with a five-inch to seven-inch leg stump is possible.

Injuries of the Knee-joint

A punctured wound such as that due to a bullet or a small shell fragment, causing haemarthrosis only, is rare, but responds well to treatment. There is a synovial wound only in this case. More common and serious wounds are as follows:

1. *Small or Moderate-sized Wounds with Fracture of the Knee involving the Joint, with the Missile in situ.*—These produce a dangerous condition, owing to the presence in the joint of septic particles of clothing, earth, etc., and owing to the existence of fissures more or less prolonged into the shaft of femur or tibia, whence arises a formidable osteomyelitis (Fig. 3). Unless there is intervention, death ensues in two-thirds of the cases from gas gangrene or articular septicaemia.

2. *Fractures of the Bones forming the Knee-joint due to Penetration of a Condyle.*—These fractures are often followed by acute septic arthritis. If the patient is not carried off by acute septicaemia he is liable to suppurative arthritis, to deep diffuse cellulitis of the thigh, and to secondary haemorrhage from the popliteal vessels. In short, if intervention is not practised at once, amputation soon becomes necessary, and only too often it is unable to save the patient's life. This is exemplified by numerous specimens in the war collection.

3. *Destruction of the Knee.*—Complete crushing of the joint is usually accompanied by fissures extending the length of the tibia and femur. Often the vessels and nerves are damaged. Shock is considerable. Gangrene quickly develops, with the formation of gas and fetid sloughs, if not true gas gangrene.

THERAPEUTIC MEASURES

In short, apart from the first type of injury, wounds of the knee are of extreme gravity if they are left untreated in the first few hours. It is necessary to act at once, and to be beforehand in dealing with whatever may be happening. The measures available are:

1. Immobilization with or without aspiration. This is suitable for the first type. Repeated aspiration may be required.

2. More usually, in the first type, primary excision of the wound or edges of skin, underlying tissues, and synovial membrane is made—the joint is washed out by some—and this joint lining is then sutured, but the overlying structures are left open. Immobilization is essential, and subsequent aspiration may be employed.

3. Arthrotomy, with or without excision of the wound. This treatment differs in no way in its application or technique from that of civil practice.

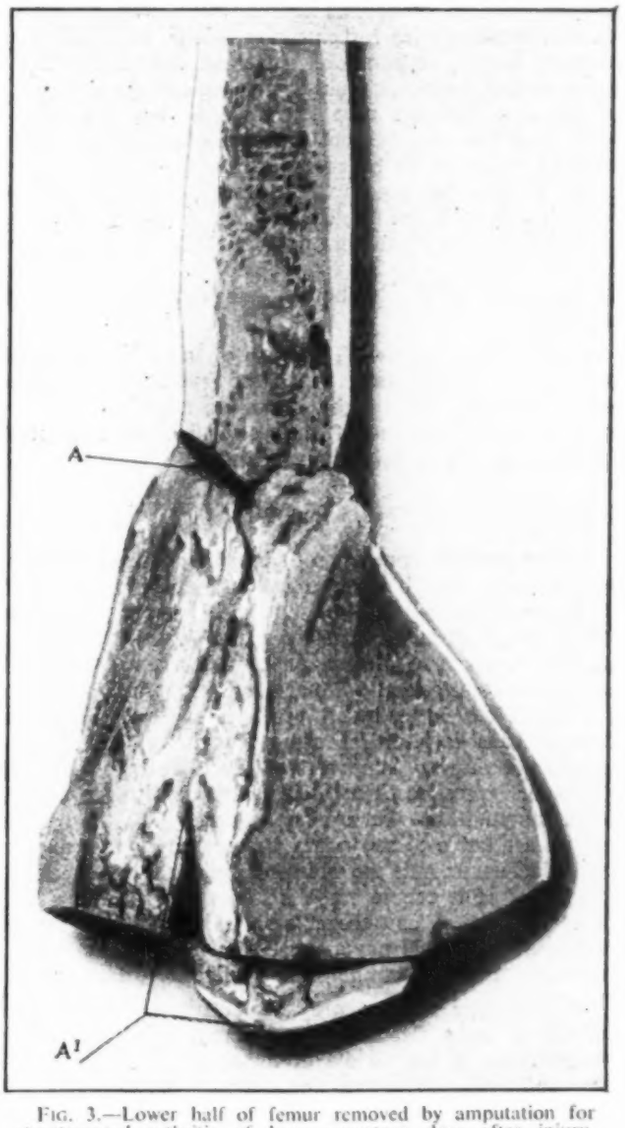

FIG. 3.—Lower half of femur removed by amputation for streptococcal arthritis of knee seventeen days after injury. Longitudinal section of bone, with fissure opened out to show continuity of pus from fracture to articular cartilage. A, Fracture. A1, Fissure extending to joint. Fig. 3 is reproduced from the *British Journal of Surgery* (1917, **5**, No. 18), by kind permission of the editor and of the publishers.

4. Posterior drainage is unsatisfactory.

5. Arthrotomy followed by active movement. This originated in Belgium: in British hands it was not a success.

6. Primary excision of the knee is not practised by British surgeons for suppurative conditions.

7. Amputation is required in gross disorganization as a primary measure, in suppurative arthritis, before or during septicaemia, and in severe leg injuries extending into the knee-joint.

Primary amputation is indicated if the condyles and shaft of the femur are split up and there are fragments as high up as the middle of the bone, because the risks of infection with so much loss of substance are considerable. The prognosis of most of these amputations is always grave. Pre-operative transfusion is valuable and the mortality is lower in the primary amputations than in those where delay has been incurred.

The conclusions are, therefore: (*a*) for articular bullet wounds employ simple immobilization with aspiration or primary excision; (*b*) for foreign bodies in the joint, arthrotomy and immediate extraction; (*c*) for fractured patella, excision; (*d*) for extensive injury, especially with vascular injury, amputation. After all operations on the knee the first dressing should be delayed and the temptation to insert a drainage tube be avoided. No one with a wound of the knee (except the simple perforating bullet wound) ought to be evacuated without surgical exploration. If there has been an arthrotomy, evacuation should be delayed until the twelfth day. For the transfer, the limb should be immobilized, preferably in a posterior half-gutter plaster or an interrupted plaster. It is better if the journey should be of less than twelve hours' duration.

Ankle-joint Wounds.—These are often so extensive that amputation is indicated. When the fracture is limited to one bone treatment on the principles advocated may be carried out. Excision of the astragalus when it is in pieces may help towards joint drainage.

Vessels and Nerves

I have made little mention of injuries of these important structures, chiefly because others are dealing with them. It is pertinent to point out that sciatic nerve sutures are often required in post-war surgery, but little vascular surgery is required at that date. All wounds of muscle and bone complicated by vascular injury must be classed as grave if a large blood vessel is injured. Secondary haemorrhage is seen far more frequently than in civil practice owing to suppuration. In the thigh and calf (from the posterior tibial) it is serious, and often necessitates amputation. Penetrating wounds of the gluteal region are liable to secondary haemorrhage. This appears to be less common if the wound is opened up as a primary measure. If it occurs when no operative measures have been undertaken and there is an entry and exit wound, the operator should have no hesitation in joining the two wounds. Ligation of the internal iliac is to be avoided.

Amputations.—These are also dealt with elsewhere, though I have frequently mentioned these operations. Amputation of the middle or lower third of the thigh is required only too often: the operator will be in doubt as to the advisability of closing such wounds. In primary operations six silkworm-gut sutures will often form an excellent closure and save pain in dressing. As a secondary measure this is often unwise. In preference to the guillotine operation, skin flaps may be cut and stitched back. Carrel's tubes may be placed over the muscular mass for a few days, and then the skin flaps freed and allowed to drop over the end of the stump.

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EXPERIMENTAL METHOD IN THE CONQUEST OF DISEASE

SIR EDWARD MELLANBY'S LECTURE

The thirteenth Stephen Paget Memorial Lecture was delivered under the auspices of the Research Defence Society on June 13 by Sir EDWARD MELLANBY, who took as his subject the experimental method in the conquest of disease. Lord LAMINGTON was in the chair.

Sir Edward Mellanby said it was now possible to count the blessings they and their fellow-men had secured as a result of the wide adoption of experimental science and offer up thanks for their good fortune in being allowed to use this method.

"It is my usual habit to pass down Whitehall on the top of a bus at 9.45 each morning. Whatever may have been my daydreams up to this point, I am suddenly brought to life by seeing in a shop window [the premises of one of the anti-vivisection societies] models of some of my own rachitic dogs exposed to the public view. I realize then that I have not always spent my days in an office, and I remember that it is just because it is possible to see these models of deformed dogs that it is difficult to see the same kind of deformities in children throughout the country. In the memory of many of us stunted children with bandy legs were so common as either to pass unnoticed or be a source of amusement. If we saw them now we would be angry, because we would realize they were the products of ignorance or negligence. Many women are still paying the toll of this disease either by their own death in childbirth or by that of their babies. As the present generation of girls become mothers it is certain that this particular disability will greatly diminish."

The lecturer proceeded to define the terms "experimental method" and "experiment," pointing out that there was still a good deal of confusion in the minds of some people as to the difference between experiment and observation. An experiment consisted essentially of changing a condition or conditions by active interference, whereby any effect produced by these changes could be tested. He discussed the parts played by the experimental and the observational method in obtaining information about the working of the body, taking as an example a human disease—Bell's palsy—where the lesion seemed so simple and superficial that the observational method ought to be most effective. Here a problem of long standing was only settled by the experimental method, whereby Bell showed that the condition was essentially a paralysis of the seventh nerve, and further that the seventh nerve was the motor nerve of certain muscles of the face and not of other facial muscles. If all the clinical conditions encountered by the physician were as simple as Bell's palsy the need for animal experiments would be greatly reduced. Usually the physician only recognized what he was looking at because of the knowledge brought to him by the experimenter, who, by simplifying his experimentally produced conditions and analysing their effect, had been able to teach the clinician the functions of each structure and what happened when that structure was absent or abnormal.

Reliability of Experiment

One of the fundamental properties of the experimental method which had to be recognized was that a particular experiment always recorded the absolute truth. The words "good" and "bad" in connexion with an experiment had no meaning at all, except in so far as they reflected the goodness or badness of the experimenter. An experiment might be a bad one for many reasons, but these had nothing to do with the changes of the reacting material of the actual experiment.

"It is this sense of certainty and reliability of the experimental method, throwing as it does the complete onus of the work on to the experimenter, which gives such great intellectual satisfaction to the investigator and puts him on his

mettle. It makes or ought to make the medical scientist who uses this method a very careful and humble person, because he realizes that success or failure depends entirely on himself. He recognizes the enormous difficulties of the experimental method in biological investigation, due to the complexity of the interacting materials, which have prevented the establishment of simple laws such as the physicist and chemist know. He assumes, however, that the absence of biological laws is only due to complexity of structures and functions of the material used and that, apart from this, there are no forces interfering with the reactions beyond those that are peculiar to highly complicated chemical substances. His success has warranted this assumption."

Every experimenter in medical science knew that Nature always played fair, and that his own mental ability was the limiting factor in his work. All of them remembered with discomfort the times when they had failed for one reason or another to get the true benefit of some experiment or series of experiments on which they had spent much time or trouble. The experimental method was infallible and powerful, but the experimenter was often very fallible. Fortunately the mistakes made were generally in the nature of the deductions drawn rather than of the facts observed in the experiment, and these were quickly remedied by other investigators.

"There is a belief widely held by the public that medical men, including those engaged in research work, form a kind of closed ring and not only support each other, whether right or wrong, but prevent any recognition of discoveries made by others outside the ring. Little do these people know of the real state of affairs. I suppose next to making a discovery itself the greatest mental satisfaction comes to the investigator who disproves the facts or theories of his fellow worker, and more especially is this the case if, by adding another fact or another idea, he can put the whole problem on to a proper basis."

Limitations of Human Experiments

Sir Edward Mellanby went on to say that the clinician had always been and probably would always be handicapped by the limitations of the experiments which could be made on man himself. Here he had to depend almost entirely on observation. Additions to knowledge in the future, as they had done in the past, must depend on experiments on animals. The guiding principle in determining whether any test should be made on human beings must be the simple question: "Would the doctor allow this to be done on himself or on some member of his family?" If he would not, then the experiment ought not to be done. This limitation would soon bring about a realization of the small scope allowed to the clinician in his investigation on human beings.

By means of animal experiments it was possible to track down the factors operating to produce disease. This method had been especially successful in the study of nutritional diseases. In infectious diseases also the animal experimental method had formed the keystone of knowledge, although in this group much knowledge had also been obtained by the study of the natural history of each disease independently of experiment. In some cases it had not been possible to reproduce the infectious human disease in animals, and yet only by the use of animals had fundamental facts been obtained. The nature of diphtheria toxin and toxoid and the possibility of producing antitoxin became known as the result of animal experiments. There was every reason to believe that the proper use of the present knowledge of the actions of these substances would result in the disappearance of diphtheria from this country as it had done in parts of Canada and the United States. In the case of measles no animal experimental method had been available for the production of the disease, and no method was known of growing the virus outside the human body, therefore knowledge of methods of controlling the disease had been delayed. Fortunately, information obtained by animal experiments in other virus diseases allowed certain limited tests to be made on human beings which had led to the use of human immune serum in measles, so that it was now possible either to suppress the disease or to modify its intensity if cases came under treatment early.

Revelation of Disease Processes

Nearly everything known about disease of the endocrine glands had resulted from animal experiment. Indeed, there was hardly a function of any organ of the body that had not been originally disclosed by animal experiment, and no doctor, even if he be an antivivisectionist, could discuss intelligently any process of a physiological or pathological nature without using knowledge acquired by such experiments. Occasionally it was possible, as in the case of scurvy, to apply practically every fact gained by the animal experiment directly to the human disease. The same kind of identity of experimental and natural disease was seen in the case of rickets in dogs, in xerophthalmia and night blindness in rats, in epidemic influenza in ferrets, and in some other infective conditions. The mere production of a particular pathological condition by an experimental method in an animal, of course, did not always mean that the same condition in man had an identical cause, although there was generally some relation between the two. An outstanding instance was the experimental production of middle-ear disease in rats by deprivation of vitamin A. Clearly in human beings there must be other causes than vitamin A deficiency responsible for this condition, for it commonly occurred in children with abundant vitamin A in the diet. Possibly the common factor in this localized infection in animals and man was the blocking up of the Eustachian tube and other passages of the middle ear.

Sometimes the experimental work on an animal disease, although of great value, might not prove to have the complete identity with the human disease which was originally thought. An instance where the clinical application of an animal experimental inquiry had been quite different from that expected was the discovery of the curative factor of pernicious anaemia in mammalian liver by Minot and Murphy.

"When these investigators repeated on human beings the work of Whipple, which demonstrated the effect of foodstuffs on the regeneration of red blood corpuscles and haemoglobin in secondary anaemia in dogs, they expected positive results with liver in the case of secondary anaemia and negative results in pernicious anaemia. Their surprise can be imagined when the first of these effects—that is, on secondary anaemia—was relatively slight, while the effect on cases of pernicious anaemia was great. This was undoubtedly one of the most dramatic results ever obtained by clinical trial, and its importance was none the less great because it was completely unexpected, so far as the animal experimental results obtained by Whipple, which formed its basis, were concerned."

The results gained by the extension of the findings of animal experiments designed to throw light on a condition other than that for which they had proved to be of immense value illustrated another important fact in medical research. A remedy was discovered for pernicious anaemia, making all the difference between the healthy life and rapid and certain death, at a time when nothing of the causation and but little of the pathology of the disease was known. The same applied to other controllable diseases such as diabetes mellitus, myotonia, myasthenia gravis, and in the case of surgical treatment, enlarged and infected tonsils, appendicitis, and exophthalmic goitre.

Elusiveness of Cure for Cancer

The great standby of the antivivisectionist nowadays was the failure of the investigator to find a cure for cancer in spite of all the animals sacrificed in experiment.

Nobody was more conscious of the failure to discover methods of preventing and curing cancer than those engaged in this work. This was the hardest problem yet encountered in either medicine or biology. Those engaged upon it, however, were certain that the experimental method was the principal route towards the required knowledge, and they were hopeful that this problem would submit ultimately to this type of investigation, as had happened in so many other cases.

The antivivisectionist might not always be able to jeer at the relative lack of success of the experimenter in discovering a means of controlling cancer. Probably even now a cloud the size of a man's hand which had recently appeared on the horizon might overwhelm their opponents if it did not silence them. Bittner had recently found that certain strains of mice, 65 per cent. of which normally developed cancer of the breast, remained free from this disease if breast-fed by mice of a strain that did not develop cancer. On the other hand, mice of a non-cancerous strain had been found to develop cancer of the breast in large numbers if breast-fed in early life by cancer-susceptible mothers. This observation, which had been confirmed, was one of the most promising of the many recent discoveries obtained in cancer research. Of the multitude of ideas that had been held to throw light on the cause of cancer, it had never previously been imagined, much less demonstrated, as had happened in this case, that the pre-cancerous stage was determined by the diet in early life.

Streptococcal Infections

After all, it was only three years or so ago that they were in the same predicament as regards streptococcal and pneumococcal infections. When Lord Linlithgow retired from the chairmanship of the Medical Research Council on his appointment as Viceroy of India the last words he said to the lecturer were, "Do you think we shall ever find a method of curing streptococcal infections?" Within a year of that question the work of Domagk, followed by the clinical tests of Leonard Colebrook, soon showed the world that the back of this immense problem was broken. It was pleasant to think that, as the result of these discoveries by animal experiment, on the average only four or five out of every hundred women who developed puerperal sepsis need now die, instead of the twenty-two or more per hundred previously killed by this disease; that whereas seventeen out of every hundred people under 50 years of age who contracted pneumonia previously died, that number had been reduced in Birmingham, and probably elsewhere, to less than two per 100; that the cure of gonorrhoea, which used to take five or more months of constant and disagreeable treatment, now took in most cases only a week or so; that cerebrospinal meningitis, from which previously 80 per cent. of those attacked died, now had a mortality rate of only 5 to 10 per cent.; that in streptococcal and pneumococcal meningitis, from which practically every victim died, many lives were now being saved; and that genito-urinary infections which up to recent times had always proved most refractory to treatment could now be rapidly and successfully treated.

"These are some of the fish landed by the net of chemotherapy, the discovery and fabrication of which were determined solely by animal experiment. Is there any man of sense still alive who thinks that the sacrifice of possibly thousands of mice was too high a price for these discoveries? Can any man or woman still assert that animal experiments are a futile waste of time?"

In conclusion, Sir Edward Mellanby described the experimental method as the royal road of discovery and its acceptance and wide practice as the greatest intellectual contribution ever made in the history of mankind for the protection of his bodily and material welfare. It had transformed the life of civilized man. It had provided him with practically all his present knowledge of the bodily functions. It had led to the prevention and cure of disease affecting millions of animals and men, it had prolonged life and warded off death, improved the physique and general health, and reduced the tragedies and griefs of mankind, and it had afforded the means of greater enjoyment of the benefits and beauty of life. But while all these facts were obvious there was still a wide gap between the knowledge now placed at the service of mankind by the use of the experimental method and its general employment. It was not the task of the experimenter to popularize his discoveries, and it ought not to be his job to defend himself and his methods against the attack of a minute section of the public. The experimenter did not complain, however, for he saw medical men in practice and even the general public becoming more inclined to make rapid use of his teaching, and the voice of opposition against his methods of discovery becoming ever fainter. Much as the experimental method had done in the past, it would do more in the future. The *tempo* of discovery was increasing rapidly throughout the world, and man's control of his own destiny, so far as health and disease were concerned, was becoming correspondingly greater.

A hearty vote of thanks was accorded to Sir Edward Mellanby on the proposition of Sir Henry Dale, seconded by Sir StClair Thomson, and Professor A. V. Hill and Sir Leonard Rogers urged the claims of the Research Defence Society to public support.

A HUMAN MILK BUREAU

SERVICE AT QUEEN CHARLOTTE'S

Within the last three months an important and much-needed service has come very quietly into existence for saving the lives of sick or fragile infants whose mother's milk for one reason or another is not available. In the 200th report of Queen Charlotte's Maternity Hospital there appears a brief reference to the proposed setting up of a human milk bureau. This project, with the financial aid of Sir Julien Cahn and the National Birthday Trust, is now in full working order. It is housed at the new Queen Charlotte's Hospital Block (not yet opened as a hospital) at Hammersmith. The bureau was set up partly as a result of the necessity for supplying human milk to the St. Neots "quads" and in answer to S O S messages received from time to time. Dr. Leonard Colebrook, when visiting Boston, U.S.A., a year or two ago, saw a similar bureau in operation, and on his return suggested that a service of this nature might be appropriately run from Queen Charlotte's. A similar service has been available in the United States for twenty-five years, and there are organizations of the kind in Canada, Germany, and Russia. Before the service was installed at Queen Charlotte's the matron, Miss Edith G. Dare, went to Boston to study the procedure.

The milk is obtained from nursing mothers who are recommended to the bureau by the medical officers of health of five West London boroughs. It is taken only from nursing mothers who have carried their infants to full term, not from any cases of prematurity or stillbirth, and the mothers have to reach a high health standard. Before being placed on the bureau's list the milk is thoroughly tested. The mother is then supplied with the necessary equipment, consisting of a simple water pump, towels for covering hair and clothes, bottles in which the milk is stored, and a container of dry ice in which the bottle remains until collected. Fresh bottles are supplied each day after washing and sterilization at the bureau. The collection of the milk by car takes place each morning, the mother and her child are seen every day, and if the child is not making normal progress and attending an infant welfare centre once a week the milk is not accepted. Complete records of the weight and progress of the children, and of the amount of milk given by the mother, are kept at the bureau.

When the milk reaches the bureau it is tested in the laboratory for fat content, for any possible adulteration by illegitimate additions of water or cow's milk, and for dirt and bacteria. The bottles are then emptied into a container, the milk being strained through sterilized butter muslin as a further precaution, and mixed together by a plunger. The milk is then poured into fresh bottles and placed in a pasteurization plant, where it is heated to 145° F. for half an hour. After rapid cooling it is ready for use. Milk which is not immediately needed is placed in a refrigerator at 45° F. and left for twelve hours. At the end of the day unused milk is frozen into small cakes, about the size of a half-crown, between blocks of chemical ice (carbon dioxide ice), which are stored in glass bottles at a temperature of 10° below zero. These frozen cakes retain all their vital constituents; on testing after six months' storage the difference between the stored and fresh milk has been found so slight as to be negligible.

The bureau has at present twelve mothers on its books, with a total production of 150 to 180 oz. per day, and since its inception it has dealt with about 9,000 oz. of milk. It has supplied Great Ormond Street Hospital and some of the L.C.C. hospitals, also private practitioners. The mothers are paid at the rate of twopence per ounce. The improvement in their health and also the increased amount of milk produced is said to be remarkable. In some cases the financial assistance saves them from the necessity of going out to work, or is a means of providing them with extra nourishment. The bureau (Riverside 1126) is at call night and day, and the milk can be dispatched almost immediately to any part of the country. A sum of sixpence per ounce is charged, but special arrangements can be made in the case of necessitous patients.

MENTAL HYGIENE CONGRESS

The sixth Congress of the European Committee for Mental Hygiene was held at Lugano, Switzerland, from June 4 to 6, on the invitation of the Swiss Committee for Mental Hygiene, under the presidency of Dr. A. Repond. The British delegates included Sir Laurence Brock, chairman of the Board of Control, and Sir Hubert Bond, the Senior Commissioner, who were representatives of the British Government; Dr. Doris Odlum, representing the National Council for Mental Hygiene; and Dr. Emmanuel Miller and Dr. G. R. Hargreaves of London, who both read papers.

Proceedings at Lugano

The subject of discussion was "Mutual Understanding and Mental Hygiene," and the programme included the following papers: Comprendre et compréhension mutuelle (Dr. G. Bailly, Zurich). Les bases biologiques et psychologiques de la compréhension mutuelle (Dr. Vié, Paris; Professor Kretschmer, Marburg; Professor Auguste Ley, Brussels; Dr. Hattingberg, Berlin). Définition et nature générale de la compréhension mutuelle (Dr. E. Minkowski, Paris). Civilisation primitive et compréhension mutuelle (Dr. E. Miller, London). Les obstacles à la compréhension mutuelle (Professor E. Claparède, Geneva). L'éducation à la compréhension mutuelle (Dr. H. Meng, Basle). Compréhension mutuelle entre groupes humains et entre peuples (Dr. Hargreaves, London). Vie économique et compréhension mutuelle (Dr. Billström, Stockholm). Religion et compréhension mutuelle (Dr. A. Kieholz, Germany). Compréhension mutuelle et vie familiale (Dr. Morgenthaler, Berne).

The members of the congress were entertained with great hospitality to a banquet, and an evening party was held on the Lake of Lugano by the Swiss Committee for Mental Hygiene and by the town of Lugano. Fourteen countries were represented, and there was an attendance of over eighty persons. The atmosphere was extremely friendly, and it was generally agreed that the congress had provided a valuable means of increasing mutual understanding.

Future Work in Europe

At a business meeting a constitution for the European Committee for Mental Hygiene was formulated, and the following officers and committee were appointed to hold office for the next three years: President: Professor Auguste Ley (Brussels). Hon. Secretary and Treasurer: Dr. H. Bersot (Le Landeron, Switzerland). Vice-Presidents: Professor Boumans (Holland), Dr. Charpentier (France), Professor Medea (Italy), Dr. Doris Odlum (Britain), Dr. Roemer (Germany). At a meeting held after the congress invitations were received from Sweden and Holland, and it is hoped that the next congress will be held in one of these countries in June, 1940.

The conference closed with a discussion on "The Immediate Tasks of Mental Hygiene in Europe." Those who took part in it included Professor H. W. Maier (Zurich) and Professor Fahreddin Kerim Gökay (Istanbul). Dr. Doris Odlum proposed that the committee should make a survey of the various aspects of mental hygiene in all the European countries, as the information would be of the utmost value both to those who were more advanced and those who were more backward in this field. She also proposed that the question of establishing an international nomenclature of mental disorders be pressed by the European Committee, as this was one of the essential bases of scientific investigation in relation to mental health.

Reports of Societies

THE CHRONIC UNCERTIFIED

At a meeting of the Section of Psychiatry of the Royal Society of Medicine on June 13, Dr. H. CRICHTON-MILLER presiding, a symposium was held on "The Chronic Uncertified."

Dr. G. DE M. RUDOLF dwelt upon the large group of different maladies which were covered by the term "chronic uncertified." In order to determine the proportions of various conditions found among patients of different classes he had studied the diagnosis of a large series of patients in the private, voluntary, and temporary categories, in the psychological out-patient clinics of general hospitals, and in a hospital for nervous diseases. He found anxiety states to be present in about one-third of the private and hospital cases. Confusion was diagnosed in one-fourth of the temporary and voluntary patients, and depression was responsible for one-fourth of the voluntary and general hospital groups. The sexes were equally distributed among the private and hospital patients. One-half of all patients were between 20 and 40 years of age, but children were artificially eliminated from the analysis. Of the temporary cases one-third were acute in nature and so could be omitted, but among the other groups the illness had been present for months or years rather than for weeks.

With regard to the treatment of depression, he had found benzedrine work very well in simple cases when the depression was in the early part of the day. In early schizophrenia a number of cases improved, without any drug treatment, merely by transference from a mental to a manual occupation.

When to Certify

Dr. NOEL HARRIS said that the problem of the chronic uncertified case arose in connexion with those individuals whose behaviour was sufficiently irresponsible and asocial by reason of their mental abnormality to cause trouble to themselves and their relatives and friends, although they did not show the specific psychotic reaction which led one to say that they must be certified. The problem presented by such people was far more thorny than the certifying of the acute psychotic. The individual of psychopathic

personality, for example, committed acts which just avoided being criminal and just avoided the criteria for certification. What were the grounds on which certification must take place? If an individual was dangerous to himself or others there was no question as to his certifiability. If his behaviour was interfering too much with the ordinary life around him, again he might be certified. If he showed gross signs of mental disorder, certification was the only way of assuring him adequate treatment. The problem became more difficult when the individual was obviously not of unsound mind but threatened to kill himself or to injure someone else. Was a physician justified in certifying a person who threatened suicide? The problem of suicidal tendency would be a little easier if local authorities and the public would realize that in psychological medicine it was one's duty to take risks at times in the interests of the patient. When a suicide took place it was by no means always an indication of careless diagnosis or inadequate nursing. Those of them who worked in hospitals which endeavoured to deal with early cases of psychosis must be constantly facing this problem. The general practitioner and the specialist were always asking them to admit cases of primary depression, and most would agree that all cases of primary depression or melancholia were potential suicides. Were they to safeguard themselves by refusing to admit these cases, thereby almost forcing certification, when they knew that by taking a certain amount of risk, and perhaps prejudicing their own reputation or the reputation of the hospital, they could help the recovery of a large number of these people? Paranoia was perhaps the condition in which it was most justifiable, if possible, to keep the patient out of a mental hospital, for change of environment and occupation might keep him going for many years. In his opinion there were occasions when it was justifiable to send a patient to a mental hospital under certificate if one was assured that the superintendent of the hospital would not immediately discharge him. This applied particularly to some hysterics and addicts. But, of course, the person who sent such a patient to hospital must explain the exact position to the superintendent, that it was a disciplinary measure, and must also obtain the co-operation of the relatives. The speaker looked forward to the establishment of some colony—on the same principle as the Papworth settlement for tuberculosis—for the chronic uncertified who did not fit into life.

General Discussion

Dr. W. CLIFFORD SCOTT said that to call some sufferers chronic and others acute was arbitrary but useful. He had found it of some assistance to regard as chronic the case which had lasted more than a year. The chronic uncertified presented a problem equal in magnitude to the problems caused by illiteracy and widespread infectious illness up to the end of the nineteenth century. The problem of the care of ambulant cases of chronic mental illness needed to be dealt with by radical changes. No mass experiment had yet been tried to test the value of modern psychiatry and psychotherapy, and it would be necessary to await the result of an experiment planned to take generations before the value of these modern methods was established. He made a plea for the development of a psychiatric service for the chronic uncertified, based on a district organization similar to that of the educational and public health services, with facilities for co-operation between family doctor, out-patient clinic, and psychiatric institution, and between the out-patient clinic, the general medical services, the court, the school, the employment agency, and so forth.

Dr. CRICHTON-MILLER said that the heart of the problem was not the people who must be certified or those who could not be certified; it was those who might be certified, but the variation in whose condition was such that they might be discharged forthwith. As to the risk of suicide, he himself had taken that risk, and although suicide had actually occurred in some cases he had saved a great many people from possible certification. Every physician must take risks, and he thought they should have a broader outlook than was exemplified by merely locking people up and feeling that by so doing they were serving society and the people concerned by saving them from the possibility of committing suicide. A certain body was now agitating for new legislation connected with the suicide problem. If this was secured, along with new legislation on addiction and the passing into law of the Criminal Justice Bill, the position of the psychiatrist would be greatly helped. The most difficult part of the whole problem was the recurrent uncertified and not the slowly degenerating senile patient or the depressive who was becoming more and more depressed.

Dr. MURDO MACKENZIE said that the chronic uncertified had increased enormously during the last ten or twenty years, thanks to the modern provision of various institutions and clinics, and to the feeling on the part of the people themselves or their relatives that they ought not to be mixed up with mental patients. They went in as voluntary boarders one day and gave notice the next. What psychiatrists had to realize was that the chronic uncertified were with them in large numbers, and that attempts to get lawyers to make doctors feel "safe" were quite futile.

Dr. LETITIA FAIRFIELD pointed out that there was nothing in the law of England which really compelled a person to be sane. A person had a right to be as insane as he liked so long as he did no harm to himself or others. That accounted for a great many of those who were within the borders of certifiability but in fact never were certified. One difficulty which arose in connexion with these people was not during their lifetime but after their death. Sometimes an individual who had passed as a harmless eccentric to his neighbours left a will which caused a great amount of injustice. Where there was that possibility of testamentary injustice it should, more often than it was, be a determining factor in putting such persons under care, especially in their old age. With regard to the recurrent psychotic, she recalled once taking part in a by-election in which there were six or seven candidates. Before her own meeting assembled she went across the square to listen to the candidate who was the most voluble, the most witty, the most irreverent, and the most encyclopaedic of the whole lot, and she heard him boast that, having been in a mental hospital and come out, he was the only candidate who held a certificate of sanity!

Dr. J. BRANDER stressed, for those who had a great prejudice against certification, its therapeutic value. The hysterics and neurotics who went on for months and years, a nuisance to their families, enjoying life as voluntary patients so long as somebody was willing to pay for them and bring them grapes every week, were pulled up with a start when they were certified, and began to recover very rapidly. He did not deplore the fact that they had been certified; he was rather gratified that, having been certified, they began so quickly to recover. The recovery rate was practically the same with these patients who had been three, six, or twelve months in other hospitals as it was with the direct admissions. He felt that perhaps more suicidal patients should be certified than was the case at present, and, moreover, that certification should be carried out before any attempt at suicide had been made, because the suicidal attempt was apt to remain a permanent trauma for the patient even after recovery.

RADIOTHERAPY AND CANCER

The first annual meeting of the Faculty of Radiologists, which was formed in February last by the amalgamation of the British Association of Radiologists and the Society of Radiotherapists, was held at the Liverpool Medical Institution on June 9 and 10. The business meeting on the first morning was followed by Dr. R. E. ROBERTS's presidential address on the subject of "Fellowship." In the afternoon Dr. J. L. A. GROUT discussed the problems of diseases of bone, with special reference to the bone changes seen in constitutional diseases and bone tumours; Dr. C. G. TEALL read a paper on a radiological study of the bone changes in anaemia and leukaemia in children; and Dr. A. E. BARCLAY gave an extremely interesting

radiological demonstration of his original work on the adult and foetal circulation. The subject at the second morning session was "The Cancer Problem."

Anatomical Approach

Professor HENRY COHEN stressed that the present treatment of cancer was essentially anatomical. The aim of the surgeon was to excise the whole of the cancer-bearing area; the weapons of the radiotherapist were similarly directed against local sites of cancer. These measures, though primitive in concept and often mutilating in effect, were often successful. They demanded a knowledge of the natural history of cancer in various sites, and in recent years many fruitful observations had been made on the path of spread, the tendency to metastasize, variations in growth and radiosensitivity, etc., which had led to improved results, both by the surgeon and the radiotherapist. The proper elucidation and assessment of the patient's presenting symptoms and the investigation of cases by all means at our disposal were imperative for early diagnosis. The fallacies inherent in all so-called "blood tests" for cancer were so great that none of them had diagnostic value. Therapy, however, was based not only on ablation of the site of disease but in general it aimed also at restoring disturbed functions to normal and eradicating or nullifying causative factors. Although certain observations on the cancer cell, notably its capacity to derive energy from the conversion of glucose into lactic acid, and the occurrence of dextrorotatory amino-acids in the products of cancer cell protein hydrolysis, seemed to be significant, none appeared absolutely specific to cancer, and as yet no helpful therapeutic measures had been based on them. The alleged greater viability of the cancer cell to such metals as lead, copper, and selenium had led to intensive research, but no strong evidence had accumulated to justify an optimistic view of their possibilities. Evidence was accumulating that the term "cancer" embraced many widely differing conditions, hence there might be not one but many causes of cancer. Pre-cancerous conditions—for example, leukoplakia of the tongue—had long been known to clinicians. Others, such as Paterson's (so-called Plummer-Vinson) syndrome of dysphagia with anaemia leading to carcinoma of the hypopharynx, had been recognized in recent years, and these conditions, together with the experimental evidence that carcinogenic agents of all types required a considerable time to induce malignant change, suggested that there was a stage of preparation of the cell for malignant metaplasia which occupied a considerable span of an individual's life, but that it was some additional factor which stimulated the prepared cell to manifest malignancy.

Curative and Palliative Radiotherapy

Dr. J. RALSTON PATERSON said that surgery, radium, and *x* rays were the only effective methods of treating malignant disease. Radium and *x* rays were fundamentally the same weapon and should not be looked upon as two distinct methods but as one—radiotherapy. Both methods should be in the same hands if the best results were to be obtained. Radiotherapy had two main functions—curative therapy and palliative therapy. It was important to realize that there was a real difference between these two purposes and that this difference affected method of treatment to a very considerable extent. Only in connexion with curative therapy had there ever been any clash between radiotherapy and surgery, because for many years, during the evolution of radiotherapy, overlapping of the two methods undoubtedly had occurred. The limits of the respective fields were now so clearly demarcated that no real clash remained, except when the surgeon, without special study, invaded the therapist's proper domain by himself employing radium.

If the application of the term "curable" was limited to those types of malignant disease which could be diagnosed with fair ease in their early stages and in which adequate treatment promised a reasonable expectation of cure, then there were really only four curable types of cancer—namely, carcinoma of the breast, of the mouth and lip, of the skin (including the genitalia), and of the uterus. Of these the first was best dealt with by surgical methods. It was now generally accepted that the other three were best handled in the first instance by radiotherapy, provided that such therapy was "radical." No other type of malignant disease genuinely answered this definition of "curable," although an occasional cure was admittedly obtained in certain types. In the surgical field, for example, carcinoma of the stomach was treatable, but permanent cure was achieved in a very small fraction indeed of all cases occurring. In the radiotherapeutic field, similarly, cure was at times brought about in such lesions as carcinoma of the pharynx and larynx, or carcinoma of the bladder, and might also be seen when the highly radiosensitive tumours were treated. Such cure was, however, to a large extent phenomenal, and the lesions could not be classed as really "curable."

It was in this field, and in the later cancers of the "curable" types, that radiotherapy had proved of such great value as a genuine palliative agent. In this field treatment was also to some extent in an experimental phase, searching to develop better methods which might eventually achieve consistent curative effects. The actual value and limitations of radiotherapy at the present day had been so mapped out that it seemed possible to attempt a systematic classification showing (*a*) the relationship between surgery and radiotherapeutic methods; and (*b*) the balance between curative and palliative radiotherapy. He had attempted such a classification, arranging the various types of malignant disease into the following main subgroups:

1. Radiotherapy, the treatment of choice.
   (*a*) Tumours of high sensitivity.
   (*b*) Tumours of limited sensitivity in accessible sites.
2. Radiotherapy and surgical extirpation both of value, but surgery dominant.
3. Radiotherapy indicated, but of limited value.
4. Radiotherapy contraindicated.

The various factors determining whether radiation therapy should be curative or palliative in intent merited detailed discussion. In curative therapy previous experience must have shown a reasonable expectation that cure could be obtained in an appreciable fraction of the cases treated by the particular method to be used. Curative therapy usually required the use of a high dosage and accepted major reactions as unavoidable. Where, however, it failed in its primary purpose it did act as a palliative measure of considerable value. Palliative therapy, on the other hand, in view of the fact that it was designed merely to prolong life to a limited extent or to deal with symptoms, did not justify a high degree of reaction. Moreover, the actual purpose for which palliation was being sought must be kept in mind during the planning of the treatment. Finally, it was necessary to realize that there was still a very large series of cases in every respect beyond radiation treatment.

In the discussion which followed Sir ROBERT KELLY, Professor W. M. FRAZER, Mr. G. F. STEBBING, Mr. B. W. WINDEYER, Dr. F. ELLIS, Dr. J. WILKIE, Dr. J. L. A. GROUT, and Professor A. LEYLAND ROBINSON took part.

The French postal authorities have issued a postage stamp with the motto: "Pour sauver la Race." It is an anti-venereal disease stamp, coloured green, which is accepted for current postal use, the small sum spent by the purchaser over and above the ordinary value of a postage stamp being allocated to the anti-venereal disease organization responsible to the Minister of Public Health for propaganda in this field.

Local News

ENGLAND AND WALES

Blood Transfusion Service

The report for 1938 of the Blood Transfusion Service states that the number of calls—6,628—during the year broke all previous records. Volunteer donors offered themselves in increasing numbers, so that it has been possible to raise the standard of recruits, discarding applicants with veins of only moderate calibre or difficulty of access. The report records the arrangements made at the time of the September crisis, when emergency measures were necessary to cope with the possibility of "a sudden and huge demand for blood, far surpassing any peace-time requirements." Steps were taken to establish a large blood supply depot within convenient distance of London, and to arrange for the collection, storage, and distribution of blood on a large scale. The measures taken have not been allowed to lapse, and the scheme evolved remains available for use in any future emergency. It is stated that the problem of finding sufficient donors is not likely to arise, so many offers having been received during the crisis that it seems certain that the supply will only be limited by the accommodation and staff available to utilize their services. With regard to the question of blood storage, the service awaits an authoritative pronouncement as to the most suitable technique and methods for general use. Meanwhile storage is already established on a small scale at four London County Council hospitals, each of which stocks two pints of blood for emergency maternity requirements. It is suggested that hospitals contemplating extension or rebuilding might be prepared to consider the provision of a blood storage unit under similar conditions.

Medical Students' Conference

The Medical Students' Committee of the National Union of Students, in co-operation with the Irish Students' Association and the Scottish N.U.S., has arranged the third annual conference of representatives of medical student societies, to be held in Leeds next month. Delegates will be accommodated and meetings of the conference will be held at Devonshire Hall, Headingley, the men's hostel of the University of Leeds. The general subject for discussion is "The Prospect for the Newly Qualified Doctor," under five heads—general practice, consultative practice, public health, the Services, research. The principal speakers will be Dr. W. MacAdam, Dr. W. S. MacDonald, Professor E. J. Wayne, Dr. R. Sutherland, and Lieutenant-Colonel R. B. Price, R.A.M.C. The conference will open with a formal dinner at Devonshire Hall on the evening of Tuesday, July 11, and close at tea-time on Friday, July 14. In addition to the business meetings clinical demonstrations will be arranged at the Leeds General Infirmary. The conference fee, which includes the cost of meals and accommodation from dinner on Tuesday evening until tea on Friday afternoon, is £2 10s. There will be free garage accommodation at Devonshire Hall and facilities for lawn tennis and squash rackets. Inquiries should be addressed to the National Union of Students, 3, Endsleigh Street, London, W.C.1, or to the honorary secretary, Mr. James Butler, Royal College of Surgeons in Ireland, Dublin.

Private Wards at the Hospital for Sick Children

The whole of the top floor—the seventh—of the new building of the Hospital for Sick Children, Great Ormond Street, has been equipped for the reception of private patients. Accommodation is provided for eighteen children on the medical side and eighteen on the surgical. There are twenty single rooms, and four wards each with four cots. The whole floor, like the principal frontage of the hospital, faces south, and each room or ward opens on to a pleasant railed balcony. The equipment comprises every facility for treatment and nursing and for the amusement of the small patients. There is a separate entrance for private patients, also reception and consulting rooms, an operating theatre with anaesthetic room, and kitchens, but, of course, the private section shares in the use of the modern installations for diagnosis and treatment possessed by the hospital as a whole. The operating theatre is furnished in the most modern fashion, with a photographic dark-room and an illuminated panel in which newly developed *x*-ray films can be exhibited. Quiet rooms are provided for waiting parents and quarters for nursing mothers. Each cot is provided with its electric lamp, its oxygen tap, its wash-basin, and other accessories. There is a small incinerator for each ward unit for the immediate burning of used dressings and the like, and the facilities for cleansing and service could hardly be improved. Patients up to 14 years of age are admitted on the recommendation of and for treatment by a member of the honorary medical or surgical staff, and, with the approval of such member, the patient's own doctor may be given facilities for visiting and collaborating in treatment.

SCOTLAND

New Glasgow Professor

On the recommendation of the Secretary of State for Scotland the King has appointed Professor James Wilfred Cook, D.Sc., to the Regius Chair of Chemistry in Glasgow University. Professor Cook, who thus succeeds the late Professor George Barger, is at present professor of chemistry in the University of London and research chemist at the Royal Cancer Hospital. From 1932 to 1935 he was reader in pathological chemistry in that university. He is the author of numerous publications dealing with chemistry, and in 1936 was awarded jointly with Professor E. J. Kennaway the prize for cancer research of the Union Internationale contre le Cancer.

University Chair for Edinburgh Doctor

Dr. Edwin Moody Robertson, F.R.C.S.Ed., M.R.C.O.G., assistant obstetrician in the Royal Infirmary of Edinburgh, has been appointed professor of obstetrics and gynaecology in Queen's University, Kingston, Ontario, and head of the obstetric and gynaecological services of Kingston General Hospital. Dr. Robertson, who is 36, was educated at George Watson's College, Edinburgh, and at the University of Edinburgh, where he graduated M.B., Ch.B. in 1926. He has acted as assistant to Professor R. W. Johnstone in the chair of midwifery at Edinburgh University, and has been assistant gynaecologist and obstetrician in the Western General Hospital, Edinburgh.

The Society for Cultural Relations with the U.S.S.R. announces a medical tour leaving London on September 9 and arriving back in London on September 29. The party will travel by Soviet boat to Leningrad and will visit Moscow, Kharkov, and Kiev, returning via Warsaw, Berlin, and Flushing. The actual medical institutions to be visited will be arranged according to the special interests of members of the party. An alternative return route via Scandinavia, or extra time in the U.S.S.R., can also be arranged. The cost is: 1st class, £68 10s.; 2nd class, £44 10s.; 3rd class, £27 10s., inclusive until departure from Kiev, after which only rail and boat fares are covered. A Soviet tourist visa and Polish and German transit visas are needed. Application should be made to the Society for Cultural Relations with the U.S.S.R., 98, Gower Street, W.C.1.

Correspondence

The Significance of Goitre

SIR,—In your issue of June 3 (p. 1153) Dr. W. Mitchell Stevens mentions reasons for dissatisfaction with the term "simple goitre," but in the course of his letter he proceeds to accept an aetiology which is much more simple than the facts allow. Iodine deficiency is far from being the only factor concerned in the production of "simple" enlargement of the thyroid gland. The multiplicity of factors have been enumerated by Sir Robert McCarrison after years of controlled investigation, many of which have a definite clinical application to both sporadic and endemic cases.

The term "simple" is certainly an unfortunate one, and it has or tends to have the effect that the doctor feels the neck, and the examination, now concluded, is followed by the prescription of iodine—very frequently in that time-honoured though in this case irrational way, "three times a day." In point of fact the enlarged gland is a symptom, the cause or causes of which have to be the subject of careful inquiry in each individual case. It is also a signal of constitutional distress, which implies that the patient should be given careful occasional supervision extending over a period of the next few years.

Unusual stresses of either an emotional or a physical kind or an acute infection convert not a few of such cases into secondary toxic goitre between the ages of 18 and 25 years—secondary because clearly preceded by months or years of "simple" enlargement of the thyroid. Fortunately this does not occur in the majority of cases of "simple" goitre, but it does occur frequently.

In the majority of cases which remain "simple" the symptom is indicative of constitutional distress. Three-fourths of the cases show the presence of hypochromic anaemia. Mental and physical lethargy, constipation, sluggish skin action with the presence of comedones and acne, lustreless hair, occasionally adenoids, and catarrhal disorders are a few of the many frequent associated disorders. There is invariably much more to do than "feel the neck" and prescribe iodine. Personal observations made in very many hundreds of such cases in the Royal Infirmary, Edinburgh, and in private have furnished abundant proof of the variety of factors concerned in the aetiology of this symptom. One in particular appears to require re-emphasis—namely, the extreme importance of dietetic deficiencies, to which Sir Robert McCarrison has during many years directed attention. I feel justified in saying this as I have been constantly assisted in the examination of my cases by the sister dietitian of the Royal Infirmary, Edinburgh. Very remarkable is the dislike which many of these patients have for milk especially, but the dislike often extends to egg and to red meat, while fruit and vegetables are often poorly represented in the diet, which is largely composed of carbohydrates. The enforced dietetic deficiencies towards the end of the great war were the apparent cause of a great increase in the incidence of simple goitre—a fact which may now have been forgotten. Chronic anaemia being present in 75 per cent. of the cases—a statement which I am making based on blood examination in all my cases—iron is important in treatment so that the thyroid gland will be nourished by good blood. With this and ample milk, egg, and red meat, the amount of iodine to be prescribed will be negligible, or in very many cases need not be prescribed at all.—I am, etc.,

Edinburgh, June 10. JOHN EASON.

Pelvic Disproportion

SIR,—I do not induce premature labour in primiparae on account of believed minor degrees of disproportion, and consider that radiographs are of little or no practical value in assessing such cases. There are certain factors which may be most misleading and which no form of measurement of the pelvis or foetal head by means of *x* rays, nor a detailed physical examination, can accurately assess.

1. The lower uterine segment and the upper vaginal collar are sometimes late in being canalized and keep the head somewhat higher in relation to the brim than it would otherwise be. In testing such a head to the brim it appears to meet with resistance.

2. The presentation of the head to the brim may be lateral, due to the tense abdominal walls keeping the foetal pole oblique to the brim and not in the position it assumes when the uterus anteverts in labour. Testing such a head to the brim is liable to give a false impression.

3. Dates are uncertain, and many carefully planned inductions are anticipated by a normal labour.

Measurement of the pelvis and foetal head by means of *x* rays may be very precise, but it must be remembered that the patient is not in labour when such radiographs are taken; therefore the following cannot be accurately assessed: (1) the exact inclination the head will have as it enters the brim; (2) the amount of flexion it will assume; (3) the amount of lateral displacement of the head that may occur; and (4) the reasonable amount of moulding it may undergo. Mr. W. C. W. Nixon's case (June 10, p. 1202) would appear to confirm my opinion. I am certain that many inductions and Caesarean sections are performed unnecessarily owing to radiographs being read too literally. I personally support Professor Munro Kerr's advocacy of a trial labour with a section as a stand-by.—I am, etc.,

Newcastle-upon-Tyne, June 13. FARQUHAR MURRAY.

SIR,—The case reported by Mr. W. C. W. Nixon in the *Journal* of June 10 (p. 1202), in which spontaneous delivery occurred although there was marked pelvic disproportion (accurately estimated by radiography), supports my contention that "trial of labour" should hold first place in the treatment of border-line cases of disproportion. On many occasions I have had similar experiences to that quoted by Mr. Nixon, although I admit not often when the conjugata vera was as low as 3.1 inches.

Induction of labour in primigravidae, which I condemned in my two postgraduate lectures published in your issues of April 29 and May 6, is advocated by Dr. Herbert Spencer (May 13, p. 1003) and Mr. L. N. Reece (May 27, p. 1112). Spencer summons to his support our mutual friend, Professor Hauch of Copenhagen. I read Hauch's paper, contained in Vol. IV of the monographs from the Rigshospital, 1939, which he most kindly sent us some weeks ago and from which Spencer quotes. But frankly, a 5 per cent. foetal mortality in primigravidae did not impress me in favour of induction of labour.

No one knows obstetrical literature, past and current, better than Herbert Spencer. He knows as well as I know that search will be made in vain in the obstetrical literature of France, Germany, Italy, United States of America, and Canada to find any body of obstetricians supporters of induction of labour in primigravidae. Admittedly there are odd exceptions in every country, as witness Professor Hauch of Copenhagen, who do support induction of labour in primigravidae. In respect to our own country the supporters are a declining number. They are, however, very tenacious and jealous of this operation, which

is so particularly identified with British obstetrics. And so we must fight on until they are completely routed and will accept our terms of induction only for plurigravidae, and only in specially selected cases.—I am, etc.,

June 12. J. M. MUNRO KERR.

SIR,—I do indeed welcome Mr. W. C. W. Nixon's letter, for I feel that it illustrates so well several of the points I have tried to make, and I am glad of any evidence of interest in the use of *x* rays in midwifery.

First, I would draw attention to the excellent *x*-ray report, which shows so clearly the mechanical factors involved. My only criticism of it is that there should be no expression of opinion as to the outcome of labour. That is a clinical problem, and should be left to the obstetrician. It has always been recognized that in this type of pelvis there is ample room once the brim is passed (indicated here by the wide inter-ischial diameter) and that the apparently impossible often happened. Why did it happen in Mr. Nixon's case? How did a head with a biparietal diameter of 3.65 inches pass a true conjugate of 3.1 inches? Clearly not because of any hidden mysterious forces, but because the head happened to be plastic. This is the whole basis of my argument for induction. A head that is truly premature—that is, with a biparietal diameter of from 3.4 to 3.65 inches—is always plastic, almost like a rubber ball full of water, and will compress to an astonishing extent without injury. Had labour in this case commenced, as it so often does, ten or more days after the expected date instead of a few days early, there would have been a very different outcome, for in that fortnight the biparietal diameter would have increased by 0.2 inch, and, what is more important, the head would have become much more rigid, and delivery could occur only after gross overlap with internal lacerations.

In a pelvis of this kind a greatly reduced true conjugate is permissible, but on probabilities I also should have chosen Caesarean section—unnecessarily, as was seen—but if this patient has another baby I would do an induction when the biparietal diameter reached 3.55 inches and not trust to spontaneous labour on the strength of her first success, risking a late onset of labour. Only after much experience of induction in different types of pelvis will it be possible to arrive at what constitutes a reasonable risk for the baby. No one as yet has this experience. So far I have not had occasion to induce until the biparietal diameter was 3.5 inches. Mr. Nixon notes that the biparietal diameter had recovered to 3.5 inches immediately after birth, but he would surely not suggest that the head passed the brim with that measurement?

Finally, he predicts that induction for disproportion will lead to: (1) unnecessary inductions, (2) a rise of maternal mortality. I agree as to the first point—but does it matter? So far I have not seen a scrap of evidence for a rise of morbidity or mortality in series of inductions by rupture of membranes. On the contrary, in my own series, and in others I have seen, there was no maternal mortality, and actually a reduction in morbidity owing to easier labours and reduced instrumental interference. Infantile mortality was also reduced. In conclusion I deplore references to the *vis medicatrix naturae* in obstetrics as some occult power which can operate on a higher plane than simple mechanics. There are always perfectly sound reasons why delivery takes place. It is for us to anticipate them, and my plea is to give the uterus more opportunity of showing what it can do with the plastic head.—I am, etc.,

Bexhill-on-Sea, June 12. NORMAN REECE.

Prevention and Treatment of Shock

SIR,—The letter of Mr. N. L. M. Reader (*Journal*, June 10, p. 1201) strikes me as giving dangerous advice to the timid, and displays an equally dangerous lack of knowledge of the physiological principles involved in high spinal anaesthesia. High spinal anaesthesia, irrespective of the drug used, is accompanied by some degree of normal physiological fall in blood pressure. Claims are frequently made that some particular drug "does not produce a fall in blood pressure." There are undoubted differences in the toxicity of the many drugs in common use for spinal anaesthesia, and some accentuate a fall in blood pressure more than others, but the accentuation is of the circulatory effects which always accompany a subarachnoid block extending as high as the fourth or fifth thoracic nerve roots. The accompanying fall of blood pressure is produced by a summation of many factors, the chief of which are as follows: (1) paralysis of the vasoconstrictor fibres of the sympathetic nervous system, which arise from the second thoracic to the third lumbar nerve roots; (2) the tendency to local stagnation of the circulation which always accompanies flaccid paralysis of any part of the body; (3) relative inefficiency of the venous return via the inferior vena cava when the lower seven or eight intercostal muscles are temporarily paralysed, and the circulation thus deprived of some of the pumping assistance supplied by normal respiration; and (4) slight depression of the medullary centres due to the action of sedative drugs usually administered prior to a spinal anaesthetic.

I agree with Mr. Reader that the occasions on which dangerously low levels may be reached are extremely rare, but his assertion that "it is just as common for the blood pressure to remain constant or to go up as to go down" is contrary to the clinical observation of all experienced administrators. A spinal anaesthetic will prevent shock, but to administer one to an already shocked patient is locking the stable door after the horse has bolted. Unless, by *réchauffage*, including intravenous restoration of blood volume, it is possible to raise the systolic blood pressure to at least 95 mm. Hg, a spinal anaesthetic, far from offering a patient his one and only chance of recovery, will diminish or extinguish his already slender chance. Spinal anaesthesia is the sure method of killing patients with a low blood pressure plus a depleted blood volume, and insufficient appreciation of this fact by inexperienced or ignorant administrators is responsible for much of the still existent prejudice against a good method of anaesthesia.—I am, etc.,

Manchester, June 16. H. K. ASHWORTH.

Blood Transfusion with Rotary Pump

SIR,—Many patterns of blood transfusion apparatus have been advocated in the past. Though most of them have been excellent in fulfilling their function in the hands of their sponsors, it has been a frequent failing that they err in complexity and consequently lose much of their value when their use is demanded in urgency, especially in the hands of perhaps only partially practised operators.

I would like to draw attention to the simple and highly efficient apparatus described by Mr. Victor Riddell in the *Journal* of June 3 (p. 1125), since I have found that it combines the essential requirements of both emergency and continuous-drip transfusion in a practical manner suitable for use by all. The apparatus is singularly easy to sterilize, and the rotary pump is of such simple con-

struction as to be practically foolproof and almost incapable of going wrong. It has the further advantage that in cases of urgency transfusion can be started with normal saline, and blood, when available, be switched on without stopping the working of the apparatus; thus valuable time can often be saved while suitable blood is being obtained from a donor, or stored blood warmed up, etc. The apparatus can be easily worked by a partially trained individual, and can be used quite readily by one person working alone. This makes it ideal for emergency work. I personally have found it most satisfactory for use in private houses and cottages in urgent obstetrical cases when circumstances have compelled me to work almost single-handed. It should prove the greatest value for general emergency use in isolated places in the event of war.—I am, etc.,

Salisbury, June 16. E. M. DARMADY.

Organization of First-aid Posts

SIR,—It seems to be accepted that civilian first-aid posts (F.A.P.) and army advanced dressing stations (A.D.S.) are alike in function and organization. Actually, though their surgical tasks may be similar, their internal administration appears to differ. In the field the medical officer in charge of an A.D.S. is responsible not only for treatment but also for organization, control, and discipline. In a civilian F.A.P. it does not seem clear who is in command—the doctor or the commandant. Surely a doctor ought to be in command of these posts and responsible for their efficiency. However, a number of doctors say in effect: "I'll do the treatment, but someone else must run the show. I have my own work to do, and anyway it is just common sense, and so what is the need of training now?" Such men are in for a rude awakening if war does come. There *are* heaven-born administrators, few and far between, but even they develop their talent by training and experience.

In a world at war all values, routine, and individualism will go; doctors will be absorbed into the war machine. That machine has to have organization and discipline. The doctor is already recognized as the proper person to train personnel, and that training cannot stop at first-aid lectures. Who outside the profession is competent to organize these posts? Probably the only available people with practical experience in this sphere are veteran field ambulance officers of 1914 to 1918, any of whom should be able to confirm that for a "battle" A.D.S. to function smoothly for days, or even hours, on end requires a well-trained staff and skilled organization down to the smallest detail. Incidentally how many properly equipped F.A.P.s actually exist in each area—posts that could function to-morrow and where units may be trained and exercised now?

I submit that the series at present running in this *Journal* on war surgery will not be complete without an article devoted to the detailed organization and work of a civilian first-aid post. This letter has been written after acting recently as an umpire in an A.R.P. exercise; though if an emergency does arise my own work will lie elsewhere.—I am, etc.,

Maldon, Essex, June 18. IVAN PIRRIE.

Importance of Blood Examination

SIR,—In connexion with the sound recommendations of Dr. Herbert H. Brown in his letter on the above subject (*Journal*, June 17, p. 1257), may I call attention to one point that is not sufficiently stressed to students and not always observed in practice. I mean the necessity, when making white cell counts, for basing one's estimate on more than one count made from the diluted blood in the haemocytometer. This is particularly essential in the interests of accuracy when using a haemocytometer in which the graduated field covers an area of only 1 sq. mm. In these circumstances it is easy to show that where a count of thirty cells has been obtained for the whole graduated field a repeat count may give a number close to twenty or forty. In general the smaller the number of cells on the field the greater is the liability to variation between counts, and any inference based on a single count may be erroneous. The explanation of these observations lies in the fact that, with effectively perfect technique, the cells, instead of being evenly spread over the slide of the haemocytometer, tend to be distributed in a Poisson series. As a result, when only a few cells, representing a sample from all the similar areas on the slide, are counted, this number may differ fairly widely from the true mean for the area in question. Where several hundred cells can be included in the count this number can be regarded as close to the true mean for the area counted over, and the square root of this number will give an estimate of the standard error.—I am, etc.,

Rustington, June 17. A. GARDNER, M.B.

A Case of Cervical Fibrositis

SIR,—A few months ago I saw an elderly patient who suffered from severe pain in the neck which gave rise to discomfort in swallowing and worried him very much. The area affected was about the size of a half-crown and situated in the subcutaneous tissues just in front and to the left side of the larynx. He described the sensation as being like a piece of hardened leather fixed in the subcutaneous tissues of the neck, and on every swallow and frequently on every breath he was well aware of a distressful feeling which agitated him more and more.

Three weeks previously he had suffered from an inflammation of the mucous membrane around the lower jaw on the left side, which after two days suddenly got worse and gave rise to a marked inflammation of the tissues and glands on the left side of the neck. The glands were distinctly painful and some of quite good size. The temperature was only slightly raised for a few hours and then became normal and subnormal. The inflammation in the neck subsided within four days practically completely, with distinct relief to the patient, but he was then aware of pain and discomfort in the region of the neck. Upon examination by Mr. Bedford Russell inflammation was found on the left arytenoid and left side of the epiglottis. A tiny gland the size of a split pea was present just to the left of the larynx and quite superficial. Moderate left antrum trouble was also present. The antrum was quickly cured and the arytenoid and epiglottis showed no sign of inflammation after five days and the tiny gland in front of the neck disappeared.

Within a few days, however, the patient was aware of a tight hard area in the front of the neck as stated above. Medical treatment and various methods of physiotherapy were tried in vain, the condition not yielding at all, and as the sensation was that of partial suffocation the patient showed distinct anxiety. Dr. Joekes had taken a swab from the inflamed mucous membrane of the mouth and found a pure culture of *Streptococcus salivarius*, from which he made a sensitized vaccine. Streptococcal serum was applied direct to the mucous membrane of the gum during the original inflammation and gave great relief. All treatment having failed for the cervical fibrositis the sensitized vaccine was now used, but in very tiny doses, as the patient was unusually sensitive to its action. The second dose was given after five days, and the third a week later. After the last the patient was aware of a marked decrease in the tight feeling of the neck, and each

subsequent weekly dose was followed by a still greater improvement, so that within four weeks of treatment all symptoms had disappeared and have not returned. The larynx remains quite normal and no glands can be found in the neck.

Seven remaining teeth in the lower jaw and four from the upper were removed after the use of the sensitized vaccine, and at the root of each tooth in the lower jaw a practically pure culture of *Streptococcus salivarius* was found.

The previous history is distinctly interesting. Some five years previously the patient had suffered from an exceedingly severe attack of lumbago and great pain along the inner side of the thigh and calf on the left side, which was followed by anaesthesia from the calf to the ankle and slight weakening of some of the muscles in the left leg. During that attack he also had a severe inflammation of the throat, which was not improved by ordinary treatment but which yielded at once to the local application of haemolytic streptococcal serum applied directly to the inflamed mucous membrane at the back of the throat and round the tonsils. The great pain in the back and leg only yielded to a vaccine of the haemolytic streptococcus injected subcutaneously at weekly intervals. There is no doubt that some of the lumbar nerve roots had been affected during the attack.

To summarize: An elderly patient who had suffered from several attacks of what is usually called rheumatism, which had caused great pain and discomfort and for which all methods of treatment failed completely, was immediately relieved and finally cured by the use of sensitized streptococcal vaccine. This patient has suffered all his life, on and off, from growing pains in childhood and stiff neck to pains in various parts of the body, especially the back and neck in adult life, all of which, I repeat, would ordinarily be termed rheumatic. It is most interesting to note the wonderful curative effect of the sensitized vaccine and the good local effect on an inflamed membrane of the streptococcal serum. I might add that the streptococcus on the mucous membrane of the mouth was of the haemolytic type.

—I am, etc.,

BERNARD MYERS, M.D., F.R.C.P.

London, W.1, June 15.

Secondary Haemorrhage after Appendicectomy

SIR,—May I offer another explanation for the complication of appendicectomy described by Mr. Geoffrey Parker in your issue of June 10 (p. 1174)? Mr. Parker attributes the secondary haemorrhage in his case to the abscess which he found at the site of the appendix stump, and which he puts down to bruising of the adjacent caecal wall during appendicectomy through an inadequate incision. An abscess round the appendix stump is not a rare development after this operation. I have observed it at necropsy on patients who have died of causes not related, and I would suggest that its occurrence is almost entirely limited to those cases in which the usual practice of inverting the stump with a seromuscular stitch has been followed. This appears to have been done in Mr. Parker's case. The late Dr. Charles Mayo gave four reasons why he did not invert the stump of the appendix:

"(1) Invariably, in cases in which appendicectomy with inversion of the stump has been done in combination with some other surgical procedure and death has resulted, there is a pus pocket in the inverted stump up to twenty-one days post-operatively; (2) the cultured suture material used to invert the stump, once having run through the intestinal wall, invariably is infected with pathogenic bacteria; (3) non-inversion shortens the surgical procedure; and (4) I have not had occasion to regret not having inverted the stump." (*Collected Papers of the Mayo Clinic and Mayo Foundation*, 1934, p. 154.)

Presumably in most cases this "pus pocket" drains into the lumen of the caecum and all is well, but it is conceivable that it may be responsible for the development of a residual abscess in the right iliac fossa or pelvis, or even for an extensive peritonitis. It is difficult to believe that the usual practice of inversion of the appendix stump eliminates the complications that have been alleged to follow failure to invert. On the contrary, I believe it may be responsible for complications such as the one described by Mr. Geoffrey Parker.—I am, etc.,

Walton Hospital, Liverpool, June 13. J. A. MARTINEZ.

Bee-sting Anaphylaxis?

SIR,—I should be very grateful if any of your readers could give me some guidance under the following circumstances. I am a bee-keeper of some years' standing, and consequently have been stung fairly often. Usually the stings give me little trouble; the local reaction is not marked, and only once have I had any general reaction, which only amounted to slight malaise the day following.

Ten days ago I was engaged in hiving a swarm and looking through stocks together with a friend. I was wearing the usual protective veil and gloves, but on this occasion I was stung on the top of the head through a cotton hat. I am not conscious of having had more than two or three stings, and on examination afterwards could only find one sting of any consequence. Within a few minutes I began to feel faint, and retired to lie down, leaving the bees to my friend. Very shortly afterwards I began to tingle all over, and there was intense irritation in the feet and hands. I made an attempt to get into the house—about twenty yards away—and just managed to get on to a settee. The next thing was a sense of constriction at the root of the neck and a rapidly increasing difficulty of inspiration, producing a crowing noise which I could not control. The constriction in the neck got rapidly worse, and I was feeling very ill indeed—in fact, I was sure I was going to die. There was profuse sweating, nausea, intense muscular weakness, and twitching of the muscles of the lower part of my face and neck. After that I do not remember any more.

I regained consciousness about half an hour later, when I found two other doctors with me, and learnt later that I had been given 10 minims of adrenaline hypodermically. My wife tells me that during the half-hour I had been unconscious my pulse was imperceptible, that I continued with the crowing respirations and the facial twitchings, and that the head and neck were of a greenish pallor. On regaining consciousness I was first aware of intense precordial pain, which was hardly relieved by half a grain of morphine, and of gradually diminishing respiratory spasm. I was also conscious of facial twitchings which I could not control, and loss of visual accommodation, nausea, and intense muscular weakness. I was given hot tea with a good deal of sugar, which certainly did something to relieve the pain. It was about an hour before I could be got to bed. During the night I did not sleep at all, but vomited frequently. On the second day I was practically all right, apart from a hot-water-bottle burn. The blood count, taken a week later, was normal.

I should like to inquire whether any of your readers have encountered similar cases, and also to get an opinion on what was the nature of the attack. Was it a massive dose of venom given, perhaps, intravenously, or was it an allergic phenomenon?

I have been very kindly sent a number of references on the subject by the Advisory Officer in Entomology at the Marischal College, Aberdeen, which I have not yet had time to look up. Meanwhile, I thought it might be of interest to record the facts whilst they are still fresh in my memory and to solicit opinions on the nature of the attack. If it was due to a massive dose of venom I can protect myself against recurrence. On the other hand, if it was allergic, I must give up bee-keeping, as I could not possibly avoid occasional stings. I should be very grateful for advice.—I am, etc.,

June 5. "APIARIST."

Potency of Vitamin Concentrates

SIR,—While the excellent leader in your issue of June 3, summarizing the results of clinical studies on vitamin A, is a subject on which you should be complimented, it contains one statement which we think cannot reasonably be upheld and which calls for correction.

It is stated that 1 c.cm. of the concentrate used contained 72,000 international units of vitamin A and was equivalent to 2 drachms of average cod-liver oil. On the basis of 1 drachm being equivalent to 3.55 c.cm., your average cod-liver oil is thus endowed with a potency of 10,000 international units of vitamin A per c.cm.—a potency which, in fact, is exaggerated some ten times. Unfortunate though it may be, it is nevertheless a fact that since the discovery of vitamin A in fish-liver oils the cod has been relegated to a considerably lower position in the nutritional hierarchy than it formerly held, and your statement may have the effect of misleading investigators who are led to substitute an average cod-liver oil for a concentrate such as you mention.—I am, etc.,

J. I. M. JONES,
June 13. Technical Manager, British Colloids Ltd.

*** We regret the error. The actual statement in the paper referred to is as follows: "Each cubic centimetre of this concentrate, which contains no added vitamin D, contains 72,000 I.U. of vitamin A, or each minim (containing 4,000 I.U. of vitamin A) is equivalent in vitamin A to 2 drachms of standard cod-liver oil."—ED., *B.M.J.*

Chemotherapy of Gonorrhoea

SIR,—I was interested to read Dr. M. Absé's comments (*Journal*, June 17, p. 1260), for his views coincide with my own experience. I also am amazed at the specific claims made of rapid cures obtained with the sulphonamide drugs. Undoubtedly in some cases a dramatic cessation of discharge occurs; in others repeated courses of the drug are necessary; but in the majority no benefit accrues. Patients who have not responded favourably to the drugs seem to take longer to cure than those who have had none; this may be explained by diminished phagocytic activity due to a leucopenia, and probably this accounts for the lessening of the discharge. Of course, I am not referring to cases with "closed" pockets of pus, which require mechanical treatment, for in these chemotherapy is useless.—I am, etc.,

London, W.1, June 17. M. W. BROWDY.

The Services

INDIAN MEDICAL SERVICE

ANNUAL DINNER

The annual dinner of the Indian Medical Service was held on June 14, with Major-General C. W. F. Melville in the chair. The guests present were Sir Frank Brown, Mr. D. M. Cleary, Dr. H. A. Clegg, Sir Wilson Jameson, Dr. E. C. Morland, and Professor James Young. After the loyal toast had been honoured the chairman said that he had received letters from about fifty officers regretting that they were not able to be present, and he then read a telegram that had been received from the Director-General of the Service. He extended a warm welcome to the guests, remarking that a Service dinner was of its nature a somewhat self-centred affair, and therefore for one evening he would like each guest to look upon himself as being one of themselves. Recruiting to the Service had been excellent, and he had it from Sir John Megaw that the recent recruits had been as good as any before. This was the thirty-ninth dinner, and 110 of them had managed to be present. After a humorous description of the various types of Indian civil servant, Major-General Melville went on to discuss more seriously some aspects of administration. "The moment you have one man under your command," he said, "you are an administrator." Maladministration made for discontent, and it was the slight that made the assassin.

The health of the chairman was proposed in a brief and gracious speech by Colonel A. H. Proctor, who said that throughout his life he had heard the name of Charles Melville mentioned with affection. There was no officer in the Service who had such a reputation of popularity, friendship, and esteem.

It was then announced that Sir Thomas Carey-Evans was relinquishing the honorary secretaryship of the dinner after holding this post for fifteen years.

The officers present at the dinner were:

Major-Generals: Sir Frank Connor, A. W. M. Harvey, Sir John Megaw, H. R. Nutt, Sir Leonard Rogers, and G. Tate.

Colonels: H. Ainsworth, Sir Rickard Christophers, H. M. Cruddas, H. R. Dutton, A. B. Fry, J. Fuller-Good, C. A. Gill, T. A. Granger, C. R. M. Green, W. H. Leonard, H. M. Mackenzie, F. P. Mackie, A. J. Macnab, Sir Richard Needham, A. H. Proctor, C. H. Reinhold, H. E. Stanger-Leathes, Ashton Street, F. F. Strother-Smith, R. G. Turner, W. L. Watson, C. N. C. Wimberley.

Lieutenant-Colonels: W. G. P. Alpin, F. J. Anderson, R. S. Aspinall, C. H. Barber, F. A. Barker, A. N. Bose, G. T. Burke, H. P. Cook, H. S. Cormack, D. G. Crawford, J. M. Crawford, S. C. Evans, J. K. S. Fleming, B. Gale, E. S. Goss, P. Fleming Gow, V. B. Green-Armytage, F. Griffith, A. E. Grisewood, W. L. Harnett, S. N. Hayes, H. Hingston, E. H. V. Hodge, J. M. Holmes, E. V. Hugo, J. B. Dalzell Hunter, M. L. C. Irvine, I. Davenport Jones, R. Kennedy, H. H. King, E. W. O'G. Kirwan, J. B. Lapsley, J. C. H. Leicester, A. V. Lopes, G. Rigby Lynn, C. McIver, A. C. Macrae, G. E. Malcolmson, W. A. Mearns, C. Newcomb, C. Newton-Davis, D. V. O'Malley, H. Ross, H. K. Rowntree, R. B. Seymour Sewell, H. A. S. Short, H. E. Shortt, J. A. Sinton, H. B. Steen, R. Steen, W. D. H. Stevenson, H. Stott, C. Thomson, E. Owen Thurston, A. G. Tresider, E. L. Ward.

Majors: H. C. Brown, J. A. Cruickshank, Sir T. Carey Evans, V. E. M. Lee, V. B. Nesfield, C. G. Seymour, and M. R. Sinclair.

Captains: Dev. Dutt, R. L. Raymond, and Man Singh.

Lieutenants: D. H. Harrison, G. T. M. Hayes, P. Kent, W. M. McCutcheon, G. S. Michelson, and S. G. Nardell.

MEDICAL DEPARTMENT, ADMIRALTY

The Medical Department of the Admiralty will remove from its present address to Queen's House, 64, St. James's Street, London, S.W.1, during the week beginning June 26. During the period of removal it is desired that correspondence may be reduced to a minimum, letters on urgent matters only being sent to the Department. The new telephone number will be Regent 7481.

ALEXANDER MEMORIAL PRIZE

Major H. J. Bensted, *M.C.*, R.A.M.C., has been awarded the Alexander Memorial Prize for 1938, consisting of a gold medal and a sum of £40. The prize is awarded annually to an officer of the Royal Army Medical Corps for professional work of outstanding merit.

NORTH PERSIAN FORCES MEMORIAL MEDAL

Thomas Simpson, L.R.C.P. and S.I., D.T.M. and H., D.M.R.E., medical officer, Nigeria, has been awarded the North Persian Forces Memorial Medal for 1938, for his paper on "Yaws and its Treatment in Bamanda Division of the Cameroons under British Mandate," published in the *West African Medical Journal*, volume x, No. 1, October, 1938, page 10. The medal is awarded annually for the best paper on tropical medicine or hygiene published in any journal during the preceding twelve months by a medical officer, of under twelve years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service.

LEISHMAN MEMORIAL PRIZE

Major D. Fettes, O.B.E., R.A.M.C., has been awarded the Leishman Memorial Prize for 1938, consisting of a silver medal and a sum of £30. The prize is awarded annually to an officer of the Royal Army Medical Corps or the Army Dental Corps for work of outstanding merit.

Obituary

FRANCIS ROBERT SEYMOUR, M.D.

Dr. F. R. Seymour, a Principal Regional Medical Officer of the Ministry of Health, died at the age of 56 peacefully in his sleep of heart disease on June 7. He had been happily at work on the previous day; his death was preceded by only a few hours of slight indisposition, which gave no warning that the end was near.

He was born on October 23, 1882, at Armagh, where his father, the Rev. Robert Seymour, was a clergyman in the Protestant Church of Ireland. Throughout his life Frank Seymour bore witness to the influence of the piety and culture of his early home life in his love of the Classics, his interest in intellectual and artistic activity in many forms, and in his rectitude and unsparing helpfulness towards others. After being successively at the Royal School, Armagh, St. Columba's College, Dublin, and Campbell College, Belfast, he entered Trinity College, Dublin, in 1900, taking his B.A. degree in 1904 and the M.D. in 1907. He was awarded the first foundation scholarship, the first gold medal, and a senior moderatorship in chemistry and physics, and obtained his degree with honours in chemistry, materia medica, and surgery. After graduating he worked in London at bacteriology and pathology at St. Mary's and King's College Hospitals, and after taking the D.P.H.Oxon. in 1911 he was appointed a medical inspector of the Local Government Board in 1912. During the war his services were placed at the disposal of the War Office; he was responsible as sanitary officer for the health of troops, rising to be major R.A.M.C. and receiving the Médaille du Roi Albert. After the war his work at the Ministry of Health was concerned at first with tuberculosis, and later with water supplies and with the administration of the Food and Drugs Acts. He was promoted early this year to be a principal regional medical officer for the south-west region of England. His work at the Ministry was marked throughout by originality and vigour, and his loss to the public health service in an enlarged sphere of activity is greatly to be deplored.

Seymour will long be remembered for the zest and energy which he applied to his professional work, to his many and varied literary and scholarly interests, and to his domestic and social life. His quick wit and love of fun, the big heart which matched his frame, and his penetrating but kindly shrewdness were qualities which fascinated and delighted his friends. No one was ever dull with Seymour. He was a true friend; to any who were in need he gave freely of his time, care, and material help. He married Dr. Ida Mirrielees Bernard in 1916, and is survived by her and by their three daughters.

The death of Dr. F. R. Seymour (writes another colleague) takes away at the height of his powers a man whose knowledge of preventive medicine won universal respect. He returned after war service to supervise the development of local authority schemes for the treatment of tuberculosis and infectious disease. He had the right kind of personality for this work—a nimble wit, a decisive mind, and mature judgment. He knew his subject thoroughly and always took pains to study local conditions before making a visit of inspection. His quick, intuitive assessment of character made it impossible for local officers who followed the line of least resistance to gloss over the defects of their organization. Dr. Seymour used to weigh in with terrific force, and had a disconcerting habit of going right to the heart of his subject. He never wasted time on neutral ground. When he suspected humbug the knees of his adversary were soon loosened. Yet he seldom left behind him a sense of grievance. Justice was done, and his criticism, however trenchant, was tempered in the end by a jest and a few words of friendly encouragement. He fully appreciated the difficulties encountered by the weaker brethren in the public health service, and he understood and loved his fellowmen. Outside his professional work Dr. Seymour was a man of many interests. Those who were privileged to know the gracious atmosphere of his home were constantly delighted by his wit in conversation, and surprised to discover the many curious treasures of knowledge which were stored in his mind. He was a good linguist and enjoyed travel; but he was attracted by people rather than scenes. The natural charm and courtesy of his manner won him many friends abroad, and his home was always open to entertain visitors from other lands.

In the course of time promotion had the effect of removing Dr. Seymour from the field of work where his talent and his chief interests lay, and his last four years were spent mainly in the central office. He quickly mastered the detail of his special subject—the protection of food supplies—and then proceeded to adorn minute sheets and reports with the distinctive quality of his own style. He never wrote a loose sentence, even in a casual note. He was an artist in all his activities. No account of Dr. Seymour's work would be complete without some reference to his influence on younger men. He was a wise counsellor, and his many friends never looked to him in vain for advice and help in their difficulties.

ALICE M. BENHAM, M.D.

We regret to record the death on June 5, at the age of 66, of Dr. Alice Marian Benham, who was widely known for her professional skill, her private and public philanthropy, and her warm-hearted and public-spirited outlook. She received her professional training at the London School of Medicine for Women, graduating M.B., B.S.Lond. in 1904 and proceeding M.D. six years later. She had in her earlier professional years held the posts of house-surgeon at the Children's Hospital, Sheffield, medical officer at the Church Army Dispensary in Marylebone Road, and clinical assistant gynaecologist to out-patients at the Royal Free Hospital. She then started a practice in Oakley Street, Chelsea, where she found scope for fine work among women and children. She had previously worked also in a medical mission hospital in the Province of Madras.

In September, 1914, Dr. Benham went out to Belgium with the staff of the British Women's Field Hospital, and assisted in the evacuation of the Antwerp hospital patients through Ghent and Ostend to England. In the following year she led a contingent of British women medical practitioners and nurses to Russia to look after the Polish refugees, adding to her duties the task of medical supervision over a large area in Russia; her nearest medical colleague was some forty miles away, the Russian doctors and nurses having all been mobilized. After the war she resumed her work in London in the quietly efficient way which endeared her to so many. She also took a very active interest in the work of the St. John Ambulance Brigade, becoming lady divisional surgeon to the No. 10 Nursing Division. In 1938 she was honoured with the dignity of Serving Sister of the Order of the Hospital of St. John of Jerusalem. Her medical work at the St. Theresa Hostel was also keenly appreciated. She was

especially devoted to the medical work of the Church Army. She became a member of the British Medical Association in 1908. Among the other social undertakings which attracted her sympathy and support were the British Federation of University Women at Crosby Hall, where she interested herself particularly in promoting the work for refugees, and the National Society of Day Nurseries. She also worked for the Chelsea Committee for Spanish Relief, and helped to support one of the adopted Basque children.

The Isle of Man has sustained a severe loss through the death of Mr. HAROLD EDMUND EMMETT of Douglas, who died on June 11 at the age of 41. He received his medical education at Manchester University, and interrupting his clinical studies to act as surgeon sub-lieutenant R.N.V.R. during the latter part of the war, he graduated M.B., Ch.B. in 1921, and acted as house-surgeon to Professor Telford and house-physician to Dr. Bosdin Leech. Thereafter he was assistant medical officer at Crumpsall Hospital, and Hope Hospital, Salford. In 1923 he succeeded the late Dr. Malim in practice in Rochdale, and built up a large general and surgical practice. In 1926 he was appointed an honorary assistant surgeon to the Rochdale Infirmary, a post which he held until he gave up practice in that district. In 1931 he took the Fellowship of the Royal College of Surgeons of Edinburgh. In 1935 he left Rochdale to take up practice in Douglas, Isle of Man, where he was appointed at first an assistant surgeon and later a full surgeon to the Noble's Hospital, Douglas. He rapidly built up a large surgical and general practice. His untimely death has cut short a career full of brightest promise, and is a great loss both to the medical profession and to the island as a whole. A colleague writes: Mr. Emmett was a man of great talent, with a wide knowledge of almost every branch of medical work. He was a very able surgeon, and it was in this work that his real interest lay. He was unwearying in his attention to his patients, and their well-being was always his first consideration. He was a delightful colleague, good friend, and in every respect a worthy member of the profession, whose loss is greatly deplored.

Dr. FRANCIS RICHARD CASSIDI, M.B.E., died on June 13 at Magherafelt, County Derry, where he went to live after retiring from practice. A native of Youghal, County Cork, he was born in 1858 the son of Colonel Francis P. Cassidi, and from Rugby School entered Trinity College, Dublin, in 1877. He graduated B.A. in 1880, afterwards taking the M.A., and obtained his medical degrees in 1882; also the L.M. of Coombe Hospital and the Diploma in State Medicine, proceeding to the M.D. of Dublin University in 1884. Dr. Cassidi was for many years physician to the Derby Royal Infirmary, and at the Annual Meeting of the British Medical Association at Leicester in 1905 held office as vice-president of the Section of Obstetrics and Gynaecology. He was a justice of the peace and an Associate of the Order of St. John of Jerusalem.

Dr. ROBERT STEPHEN HUBBERSTY, who died on June 13, had been a member of the Sunderland Division of the British Medical Association for fifty-four years. He was born at Cartmel, Lancs, in December, 1861, the son of the Rev. R. C. Hubbersty, and was a direct descendant of the Rev. William Paley, D.D. (1743–1805), Archdeacon of Carlisle and author of the *Evidences of Christianity*, on which a paper used to be set in the Little-go examination at Cambridge. From Hurstpierpoint School Dr. Hubbersty went to study medicine at the University of Edinburgh, graduated M.B., C.M. in 1884, took the M.R.C.S.Eng. diploma in 1885, and proceeded to the M.D., with commendation, in 1888. His early work included house-surgeoncies at the Peterborough Infirmary and the Wolverhampton Eye Infirmary. Dr. Hubbersty was for many years anaesthetist to the Eye Infirmary, Sunderland, and to the Royal Infirmary, and honorary ophthalmic surgeon to the Monkwearmouth Hospital.

The death took place on June 15 at Blairgowrie of Dr. CHARLES SMITH LUNAN. He was born in 1854 at Blairgowrie, where his father practised for fifty-eight years. After education at the Royal High School, Edinburgh, and a medical course at Edinburgh University, he graduated M.B., C.M.Ed. in 1875. After a year spent as an assistant in Carlisle, he returned to Blairgowrie to assist his father, and there he practised for thirty-seven years, retiring in 1913. He held numerous public appointments, including that of medical officer of health for Blairgowrie. He had also numerous social interests; for many years he was president of the local choral society.

On May 26 another name was added to the distinguished and melancholy roll of medical martyrs. Dr. RALPH AUGUSTINE MCDONNELL, for many years clinical professor of dermatology at Yale University Medical School, in 1903 suffered severe *x*-ray burns, which were given as the indirect cause of his death at the age of 71.

The following well-known foreign medical men have recently died: Dr. LOUIS BAR of Nice, formerly president of the French Society of Oto-rhino-laryngology, and Dr. NICOLAS, a former professor of the universities of Paris and Nancy and member of the Académie de Médecine.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Regius Professor of Physic gives notice that a course in therapeutics at Addenbrooke's Hospital, to run concurrently with the course for the examination in pharmacology, will be given in the Long Vacation, from July 13 to August 18. This course is confined to students who have passed Part I of the Natural Sciences Tripos, and are proceeding immediately to clinical work or have already started clinical work in London or elsewhere. Students wishing to attend should send their names to Dr. L. B. Cole, Addenbrooke's Hospital, at the beginning of the period of Long Vacation residence.

At a Congregation held on June 17 the following medical degrees were conferred:

M.D.—E. B. Z. Masterman.
M.B., B.CHIR.—W. J. B. de Gruchy.
M.B.—W. O. M. Ede, *B. Wright.

* By proxy.

At a Congregation held on June 20 the following medical degrees were conferred:

M.B., B.CHIR.—H. A. Wallace, M. H. Harmer.

The following candidates have been approved at the examinations indicated:

FINAL M.B.—*Part I (Surgery, Midwifery, and Gynaecology):* P. T. Anderson, L. B. G. Bennett, J. B. Bramwell, M. M. Bull, J. A. Campbell, B. E. Camus, J. L. Cardwell, J. A. Cosh, P. J. R. Davis, H. P. Dick, J. E. G. Earle, W. J. G. Evans, I. S. Eve, G. R. Faber, E. L. Fawssett, P. G. H. Gell, G. S. Gladstone, G. D. Graham, B. G. Gretton-Watson, L. N. Grunbaum, A. Hargreaves, S. L. Hetherington, B. L. F. Heydon, J. M. Holford, K. G. Irving, P. W. Isaac, G. H. P. John, H. Kalmanoff, N. S. Kenchington, E. J. C. Kendall, R. D. Kennedy, W. N. Kenrick, W. H. Kirkaldy Willis, J. A. Lorimer, A. C. Mackay, P. D. MacLellan, T. K. Maurice, J. M. Mennell, K. J. Merris, E. P. Morley, J. Murray, G. Oppenheimer, B. F. H. Parker-Wood, H. G. Percy, T. J. A. Phillips, M. R. Pollock, A. M. Stevens, R. C. Tufton, F. H. Tyrer, C. H. C. Upjohn, J. S. H. Wade, R. J. T. Woodland. *Women:* G. M. Allen-Williams, K. M. Cossens, M. Feachem, R. M. Howitt, L. C. Petersen, J. F. Thompson.

UNIVERSITY OF LONDON

Sir Henry Hallett Dale, F.R.S., has been appointed by His Majesty in Council as a Member of the Court in the place of the late Sir Cooper Perry.

Dr. A. M. H. Gray and Sir Girling Ball have been appointed Governors of the British Postgraduate Medical School, and Mr. L. V. Cargill Governor of King's College School, Wimbledon.

Dr. R. A. Young has been appointed to represent the University at the twenty-fifth annual conference of the National Association for the Prevention of Tuberculosis at Belfast from June 29 to July 1, and Professor Major Greenwood, F.R.S., representative of the University at the ninth Imperial Social Hygiene Congress in London from July 10 to 14.

UNIVERSITY COLLEGE

At an Assembly of the College Faculties on Thursday, July 6, at 3 p.m., Sir Henry Dale, M.D., F.R.S., will receive the chief scholars, medallists, and prizemen, and will give an address.

UNIVERSITY OF LIVERPOOL

The Council of the University has decided to confer on July 1 the honorary degree of M.Ch.Orth. on Mr. H. A. T. Fairbank, M.S., F.R.C.S., consulting orthopaedic surgeon and emeritus lecturer in orthopaedic surgery at King's College Hospital, London.

The Council of the University has appointed Mr. Owen Herbert Williams, F.R.C.S., to the Chair of Surgery as from October 1, in succession to Sir Robert E. Kelly, who retires at the end of the present session on reaching the age limit.

UNIVERSITY OF WALES

WELSH NATIONAL SCHOOL OF MEDICINE

The following candidates for the degrees of M.B., B.Ch. have satisfied the examiners in the examinations indicated:

MEDICINE.—J. M. Bowen, Mary W. Bowen, Marjorie E. Bright, C. Davies, G. R. Davies, D. B. E. Foster, W. H. Harris, J. C. Herapath, G. E. Hosking, D. G. Jarman, Elizabeth G. Jenkins, H. V. Jones, G. O. Lewis, M. Lewis, Mair Llewelyn, C. J. Morgan, Margaret Morgan, Josephine Parnell, Margaret Parry, J. L. Rees, W. Williams.

SURGERY.—O. D. Beresford, J. M. Bowen, Mary W. Bowen, Marjorie E. Bright, D. C. Brown, C. Davies, G. R. Davies, D. B. E. Foster, W. H. Harris, J. C. Herapath, G. E. Hosking, Elizabeth G. Jenkins, H. V. Jones, C. W. D. Lewis, G. O. Lewis, C. J. Morgan, Margaret Morgan, Josephine Parnell, Margaret Parry, Enid M. Powell, C. Thomas, Margaret R. Wade, Llary M. Williams, W. Williams.

PHARMACOLOGY.—G. B. Downs, A. A. Edwards, W. H. M. Evans, Vera Harris, W. M. Jones, J. Lewis, R. T. Nicholas, Monica Parry Morton, H. I. Rees (with distinction), Barbara C. Roberts, Eirian Spickett, J. Williams, R. W. Williams.

UNIVERSITY OF ST. ANDREWS

The Senatus Academicus of the University has resolved to confer the honorary degree of LL.D. on Mr. William Graham Campbell, M.B., C.M., L.D.S., D.D.S., Lecturer in Orthodontics in the Dental School of the University, at a graduation ceremonial to be held in Dundee during the visit of the British Association.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Primary Fellowship Examination

The following have been successful at the First Professional Examination for the Diploma of Fellow:

L. H. Aitken, M.B., Ch.B., Gwladys V. S. Aldridge, M. Arnold, M.B., B.Ch., M. Bates, W. M. Beattie, M.B., B.Ch., M.R.C.S., B. E. Blair, M.B., B.S., M.R.C.S., R. V. Blaubaum, M.B., B.S., K. E. Bond, M.B., B.Chir., M.R.C.S., R. N. Briggs, D. B. Brown, M.B., Ch.B., Annette G. Cade, H. L. Catchlove, M.B., B.S., S. Chatterjee, M.B., R. A. Christianson, M.D., A. F. Clift, M.R.C.S., D. D. Cranna, M. B., Ch. B., M.R.C.S., H. A. Daniels, M.B., B.Ch., O. B. Dickinson, M.D., H. D. Drury, M.B., B.S., J. A. C. Edwards, M.B., B.S., M.R.C.S., M. R. Ewing, M.B., Ch.B., Nora F. M. Falk, R. M. Fawzi, M.B., B.Ch., P. A. M. FitzGerald, M.B., B.Ch., H. B. Gatenby, M.B., B.S., A. Gild, M.B., B.S., J. E. Gray, M.B., B.S., S. G. Griffin, M.B., Ch.B., M.R.C.S., G. J. Hanly, M.B., B.Ch., H. A. Haxton, M.B., Ch.B., W. G. Hendry, M.B., Ch.B., L. Henry, M.D., I. M. Hill, C. Hollenberg, M.D., N. C. Hughes, M.B., B.Ch., K. F. Hulbert, M.B., B.S., M.R.C.S., I. Jacobson, M.B., Ch.B., M.R.C.S., G. B. Jones, M.B., B.S., M.R.C.S., T. L. Kennedy, P. H. Lenton, M.B., B.Ch., M.R.C.S., H. R. W. Lunt, M.B., Ch.B., R. J. B. McEwen, M.B., Ch.M., A. M. Mair, M.B., Ch.B., M. A. Margo, M.R.C.S., J. P. Mitchell, C. T. Moller, M.B., B.Ch., D. L. Mollin, D. Narayan, M.B., B.S., J. D. Ogilvie, M.B., B.S., M.R.C.S., H. Petty, F. P. Raper, M.B., Ch.B., H. Rees, B.M., B.Ch., D. J. Robertson, T. F. Rose, M.B., B.S., P. B. Ryan, M.B., Ch.B., N. C. Shah, M.B., B.S., D. C. Sinclair, M.B., Ch.B., M. R. Sinclair, M.B., B.Ch., M.R.C.S., J. W. Spence, M.B., B.S., W. E. Springford, M.B., B.S., M. J. L. Stening, M.B., B.S., H. D. Sutherland, M.B., B.S., C. H. Tanner, M.B., B.S., M.R.C.S., I. J. Thomas, E. Troensegaard-Hansen, M.R.C.S., A. A. Wearn, M.B., B.S., R. W. White, R. Wilson, M.D., C.M.

Medical Notes in Parliament

Business for the House of Lords this week included the Civil Defence Bill and a motion by Lord Samuel on the prospective decline of the population.

The House of Commons was asked to begin the Committee stage of the Finance Bill on June 22, when it was hoped to reach Clause 7, which proposes to abolish the Medicine Stamp Duties. The signatures of 197 supporters of the Government appeared in support of an amendment the effect of which would be to postpone the repeal of the Duties for five years and thus allow time for their revision on the lines recommended by a Select Committee of the House of Commons in 1937 or on some other basis. The amendment was also supported by members of the Opposition Parties, though it was understood that the Labour Party would give general support to the Government on this question.

During the week the House of Commons also considered the Ministry of Supply Bill, and draft Orders under the Military Training Act.

In the House of Commons on June 19 the Lords amendments to the Adoption of Children (Regulation) Bill were agreed to.

Medicine Stamp Duties

On June 13 Sir JOHN SIMON told Mr. Keeling that before deciding to propose the repeal of the Medicine Stamp Duties he had before him the evidence given by the B.M.A. to a Select Committee. Mr. HANNAH asked the Chancellor of the Exchequer what steps he proposed to allay the apprehension among pharmacists at the proposed repeal of the Medicine Stamp duties as depriving them of a right to be the only retailers of their own preparations unstamped, with a due sense of responsibility. Sir JOHN SIMON said he did not consider that the repeal of the Medicine Stamp Duties need have the effect which Mr. Hannah feared. It would be open to pharmacists who were at present the only retailers of their own preparations unstamped to continue this practice if they desired to restrict the channels of sale in this way; but repeal of the duties would remove the anomaly by which at present the same preparation might be sold unstamped by chemists but must be stamped when sold by traders who were not chemists.

Sir WILLIAM DAVISON asked if it would not be a safeguard for the public that these patent medicines should be sold through chemists who knew the ingredients, and would not sell them if they were actively detrimental. Sir JOHN SIMON remarked that in some cases a chemist knew the ingredients and in some cases he did not. Mr. R. MORRISON asked if the Chancellor of the Exchequer was aware that the shares of Beecham's pills went up on the repeal of the duty.

On a further question by Mr. Hannah, Mr. J. DAVIDSON asked if steps were being taken to prevent the postal services in this country being used by outside sellers to break regulations which were imposed on sellers in this country. Sir WILLIAM DAVISON also urged that in future legislation the Chancellor of the Exchequer should ensure that the prescription was clearly stated on the bottle, so that the public might know what they were taking.

No replies were given to these questions.

A statement issued to M.P.s by Sir Arnold Wilson, Sir Francis Fremantle, and Captain G. S. Elliston says:

The amendment is being backed by members for one or more of the following reasons:

"The Stamp Duties and Licence Fees have annually yielded from £1,400,000 to £750,000, the latter in the year of maximum evasion. There is a strong feeling that this is not the moment to

surrender such a sum. If evasion were stopped the yield would, according to the Select Committee (p. xi), be at least £3,000,000.

"The views regarding proprietary medicines which were regarded as justifying taxation in 1802, when the duties were introduced, have greater justification to-day, when the public is exploited on a colossal scale. Last year the net profits of a single group equalled the total yield of the duties, and one particular kind of aspirin, sold under a proprietary name, made in 1935 a net profit of £240,000, after £200,000 had been spent in advertising (p. 89 of Select Committee's evidence). The annual turnover of the industry was estimated by the Select Committee (p. xi) to be at least £20,000,000, and their unanimous view was that 'the trade in medicinal articles is one that is suitable for taxation.'

"For technical reasons it will be impossible in many cases to pass the remitted duty on to the consumer. The *Advertisers' Weekly* says: 'It is generally anticipated that the greater part of the total tax saved will be used in developing sales, and advertising should benefit accordingly.'

"In connexion with the National Physical Fitness Campaign, frequent reference has been made to the enormous expenditure on quack medicines of doubtful value. . . . The widespread advertising of proprietary medicines, often with an appeal to fear, leads the poorer and less educated public to diagnose and treat their own ailments instead of taking advantage of the public services now available. The postponement of proper diagnosis and treatment is a serious matter in many illnesses. It is unsatisfactory that those for whom adequate service is available under the National Health Insurance Acts should be encouraged to pay for proprietary medicines out of their own pockets, very often when they can ill afford the money.

"Removal of the duties will not only stimulate sales of such medicines, but will deprive the public of the safeguard afforded by disclosure of the formula. Hitherto this disclosure, together with a disclaimer of proprietary rights, has entitled qualified chemists to sell free of duty. Under the Bill disclosure will no longer be necessary, the marketing of secret remedies (which were fast disappearing) will be encouraged, and the less reputable manufacturers will again be able to vary the contents of their medicines when market conditions make it profitable to do so."

Hospital Accommodation and Evacuation

Lord CRAIGMYLE in the House of Lords on June 14 asked what arrangements had been made for the evacuation of hospitals in vulnerable areas in England and Scotland, whether the alternative accommodation required in areas not classed as vulnerable had been decided upon, and how far provision had been made for the necessary buildings, beds, and stores. He said that in the next war the peak of casualties would come at once, and in the first days the additional cases in the hospitals must be reckoned, some experts stated, in hundreds of thousands. If the hospital organization proved unequal to handling this terrible load the morale of the civil population would receive a damaging blow. He believed that the country was not up to date in the provision of buildings and stores, doctors, and certified nurses on the scale required. There must be great displacement of existing hospital patients from vulnerable areas to areas which were less vulnerable. Some patients in hospitals when hostilities broke out would be expected to return to their homes. What special provision was being made in medical attention and nurses to look after these people? A result of moving patients from vulnerable hospitals to hospitals in less dangerous areas would be that other patients or inmates in institutions which received this extraneous load would themselves have to be moved on elsewhere. In view of the vast numbers of hospital cases for which provision would have to be made there was probably not in England, and certainly not in Scotland, even after taking into account large private houses and public institutions, sufficient accommodation adequately equipped for the burden. He saw no adequate solution of the problem except the provision on a wide scale of temporary accommodation in considerable hospital units, probably of several hundred beds each, in safer areas. The Minister of Health had said that 40,000 beds were being arranged in temporary buildings. Lord Craigmyle doubted whether that was one-tenth of the number which ought to be provided. How many patients was it intended to put into each hut? Lord Craigmyle had heard that it was proposed to place a larger number of patients in each hut than most medical men considered advisable.

ORTHOPAEDIC SURGERY: NEED FOR MORE TRAINED PERSONNEL

The provision of trained personnel was even more important. During the last war between 30 and 50 per cent. of all non-fatal casualties were orthopaedic cases involving injuries to bones, joints, and the spine, and experience of air raids in Spain had shown the percentage to be 50. England had forty orthopaedic hospitals where surgeons and nurses could be trained. Unfortunately it was still the case in Scotland that there was no orthopaedic hospital capable of giving nurses an orthopaedic certificate. Scotland had magnificent hospitals like Edinburgh Infirmary, where orthopaedic work of a distinguished kind was done, but had no orthopaedic hospitals which could train young surgeons and nurses. There was, however, an institution near Edinburgh called the Princess Margaret Rose Hospital which treated children and was anxious to help the country. It could not give an orthopaedic certificate for nurses, but it could give ground for hutments free of charge. The Treasury had said it would provide these buildings and would fit them up without charge, but the moment it started to train nurses it would have to pay 4 per cent. on the capital cost. The hospital had not the money, and required every penny it could secure to run the institution. During the last war Sir Alfred Keogh at the War Office was assisted by a consultants council composed of medical men from all parts of the country, including Lord Moynihan, Sir Robert Jones, and Sir Kennedy Dalziel. He asked whether arrangements for similar advice were now being made, and what measures were taken to ensure that the War Office would know from day to day what accommodation was available for military casualties in every civil hospital.

Lord ADDISON said that if the casualties were half as numerous as many people feared 40,000 beds would be no use. During the last war when he was at the Board of Education the War Office suddenly called upon him to produce 150,000 beds. This was done by appropriating schools, and subsequently the figure became much larger. Hospitals in the cities should be used as receiving stations, with liberal provision for transport to get the patients out of the danger zone to hospitals elsewhere as quickly as possible. Whatever might be the case against underground shelters for the civilian population, surgical staff ought to be able to deal with city casualties in reasonable safety in underground clinics.

A LONDON HOSPITAL'S EXPERIENCES

Lord GREVILLE considered that for every bed in London there should be at least four beds outside. When London was divided into sectors his hospital appointed medical men to take charge of its sector. Their duty was to visit the hospitals and institutions in the country to which they were to evacuate their patients. One Poor Law institution was put down as containing 1,200 beds, but the medical man in charge said he had 600 bed-ridden patients and therefore could only provide 600 beds. All the other hospitals were very much like that; they had people they could not move, or had no arrangements for extra beds and accommodations, or their drainage was not suitable, or they had not proper cooking facilities, or had no operating theatres and no lifts. In one institution the staircases were so winding that they could not get stretchers beyond the second floor, and there was no provision for lifts. Therefore the accommodation in the base hospitals, far from being four beds to one, was more likely to be one for every four.

As regards medical officers the group medical officer was responsible for allocating medical men to different hospitals and for saying who were to stay in the casualty clearing hospitals in London and who should go to the base hospitals. So far the Ministry of Health had not told them of any allocation, or how these medical men were to be paid, or whether they were to be under any authority with a rank or to be merely civilians. They had had no information from the Ministry as to whether they were to send the senior nurses to the base hospitals and whether they were to make the

arrangements for voluntary nurses. They were asked two months ago to supply the name of a lay officer to work with the medical officer in the sector, but from that day they had not heard a single word, and nothing had been done. Domestic staff had to be provided, but they had had no information from the Ministry of Health on this subject. They knew nothing about the financial arrangements; they were told to carry on, but they would be bankrupt in a month. His hospital had no cash in hand, and when war broke out subscriptions from the Poor Law authorities and payments from the Hospital Saving Association would practically cease. There would be no satisfactory arrangements until the Government appointed one Minister to direct the whole business.

Lord IVEAGH said that in Southend the hospital wards were to have twice as many beds as usual—even in the corridors and out-patient department. That might be right after a sudden air raid, but the Government ought to have hutments ready to be put together so that casualties and sick should have proper accommodation and the ordinary services for the civil population could be resumed. Lord HUTCHISON asked what arrangements had been made by the Government with the medical schools for the staffing by older students of the various hospitals in the country to which patients were to be evacuated. It was clear that the present staffs would be kept in the danger zones to deal with casualties, and there would be no staff or medical attention available in the outer zones unless preparation had been made beforehand.

Lord MERSEY asked whether military hospitals would be available to civilian casualties caused in their vicinity. Would it be possible for the Treasury to give some guarantee for an overdraft for the essential needs of hospitals during a war? They would have to go on paying out money in salaries and wages and for food consumption. Lord ABERDEEN asked whether medical students of 20 years of age were to have their training during the six months they were called up devoted to medical work so that the country might have a supply of young doctors when need arose. It would be a great mistake, he said, if medical students of 20 years were to have their medical courses interrupted when they would serve the country better by becoming qualified. Did the Government propose to have emergency hospitals in less dangerous areas ready for the removal of patients from more dangerous ones, or were the hospitals to be erected only after the need for them had arisen? He was told that all the medical schools in Great Britain except Aberdeen were in dangerous areas. It was essential, therefore, that provision should be made for medical schools to continue their work in time of war.

GOVERNMENT REPLY: HOSPITAL PROVISION

Lord LUCAN, replying to the debate, said the principle of the scheme prepared by the Ministry of Health was that casualties should not be retained in hospitals in dangerous areas longer than was necessary. Efforts had been concentrated on increasing hospital accommodation in safer areas and on providing adequate means of transport. It was estimated that 30 to 50 per cent. of existing beds in the hospitals could be cleared by sending home within twenty-four hours persons no longer in urgent need of hospital treatment, and the nursing of patients sent home would be provided for by the district nursing service augmented for the purpose. Hospitals had been requested to make their own arrangements for transport of patients to their homes when possible, but when that was not possible the Women's Voluntary Services were arranging cars and drivers to carry out the work. The Ministry was arranging the transfer to other institutions of a number of adult patients from hospitals in the most dangerous areas. Last September arrangements were made for the transfer of between 3,000 and 4,000 patients from thirty-four of the large general hospitals in the congested areas of London to towns approximately fifty miles distant. These arrangements still stood. There were similar arrangements in the provinces.

The number of patients so to be dealt with beside those from London would be 1,000 from Birmingham, 1,000 from Manchester, 600 from Liverpool, 450 from Tyneside, and 1,200 from other centres. The Ministry was endeavouring by three methods to extend the hospital accommodation in the safer areas to which these casualties would be sent. Additional beds were being crowded into existing hospitals and institutions. Institutions at present incapable of surgical work would be "upgraded" by provision of surgical and medical equipment and also by provision of operating theatres, *x*-ray facilities, and sanitary fittings of the type necessary in such a hospital. The third method was by building hutments, which, for the most part, would be wards attached to existing hospitals and institutions. These hutments were in some cases being formed into *ad hoc* hospitals where no suitable parent institutions existed. Approximately 100,000 additional beds could in war time be accommodated in existing hospitals in England and Wales, and the majority of the beds would be in the safer areas. The hospitals and institutions which were to have these beds had been informed and orders had been placed for the necessary equipment. Nearly half of the 100,000 beds had already been distributed, and the distribution was to be completed by the end of July. Over 150 institutions in England and Wales had been marked for "upgrading," and arrangements were in hand for the necessary adaptations and supply of equipment. Medical officers and engineering inspectors of the Ministry had visited the institutions, and in many places the work had begun. It had been decided to erect new hospital buildings in the form of huts capable of accommodating 30,000 to 40,000 beds for England and Wales. The Department of Health for Scotland was erecting huts which would accommodate from 9,000 to 10,000 beds. Arrangements for constructing three-quarters of the English programme were in hand. The hospitals and institutions to which the huts were to be annexed had been chosen, and consent for the erection of the huts had everywhere been forthcoming. The Office of Works had undertaken to be responsible for the erection.

The sector scheme of hospital expansion for London [which has already been described in these columns] was, he said, being followed in every part of the country. For instance, the main base hospital for the Tyneside and Teeside regions would be the Shotley Bridge Mental Deficiency Colony, with three other mental hospitals. The mental patients would all be placed closer together; they were not to be released. In the London region group officers had been appointed from the teaching hospitals and were working out plans for the dispersal of personnel and equipment from well-provided institutions in the areas. In some cases arrangements were being made for complete transfer of such of the staff as could be spared from the centre to one of the base hospitals in the outer part of the sector. In the provinces much the same scheme was being adopted.

TRANSPORT PLANS

The success of the scheme, Lord Lucan continued, depended on the efficiency of transport. For picking up casualties in the streets and taking them to hospital it was hoped to mark 20,000 fairly small vehicles over the country as a whole, each capable of carrying four stretchers. Of 2,000 required in the county of London 1,500 had been earmarked. For inter-hospital transport the Ministry had made arrangements for approximately 800 omnibuses in England and Wales, each of which could be converted into stretcher ambulances and 300 of which would operate in the London region. Almost every one would be at the disposal of the Ministry's hospital officers, fitted to take stretchers within twenty-four hours. The railway companies had been authorized to fit up 340 brake vans to take stretchers in two tiers, each van taking thirty-six stretchers. These ambulances would be available for evacuation of casualties from any of the larger provincial towns. There would be approximately 3,000 first-aid posts in England and Wales, of which between 500 and 600 would be mobile vans fitted to carry the medical and surgical equipment of a first-aid post, together with the doctor and the nurse. The Department was examining detailed proposals for adaptation of buildings and erection of new buildings in splinter- and blast-proof material for posts, and as a rule first-aid posts were to be in basements. Drugs, dressings, and surgical equip-

ment were in process of distribution to provide an adequate initial supply for 250,000 casualty beds and also for the first-aid posts. This distribution would be completed by the end of June, and approximately nine-tenths of the drugs and dressings had been distributed to the provinces, as the London County Council had acquired sufficient reserves for its own hospitals. Distribution of beds, blankets, pillows, and stretchers would be completed by the end of August. Orders had been placed for theatre and ward equipment sufficient for 75,000 casualty beds at a cost of nearly £500,000 for the hospitals being upgraded, and delivery had begun. Schools generally were not to be used for hospitals, except that one or two public schools were to be converted into hospitals of a special character—for instance, for neurological cases. In the hutment hospitals there were to be forty beds a hut, which gave a sufficient spacing of five feet or more between bed centres. The Department proposed to erect three additional huts at one of the few orthopaedic hospitals in Scotland, of which the Princess Margaret Rose Hospital was one. The difficulty with respect to that hospital which Lord Craigmyle mentioned had been settled. The requirements of the Navy, Army, and Air Force for doctors were co-ordinated with civilian requirements through the British Medical Association's Central Emergency Committee. Recruiting of the civil nursing reserve for the hospitals by the Central Emergency Committee for Nursing was proceeding steadily, although many more nurses were required.

The debate then concluded.

Military Training of Undergraduates

Mr. W. S. MORRISON, answering Mr. Kennedy on June 12, said undergraduates now at universities or university colleges in Scotland as well as in England and Wales, and those who would enter universities as full-time students this autumn, would be permitted, if they so desired, to postpone their liability to be called up for military training until the conclusion of their course of study as approved by the university. Mr. W. S. Morrison further stated that Mr. Ernest Brown proposed to allow a university undergraduate who had provisionally registered as a conscientious objector to make his application to the local tribunal within a period ending not later than one month after the conclusion of his course of study as approved by the university. Any such undergraduate would be required to obtain annually from the proper university authority a statement that he was a full-time member of the university, and giving the date on which his approved course of study was due to terminate. This would place an undergraduate who was a conscientious objector in the same position in this respect as an undergraduate on the military training register.

Sale of Drugs

Dr. ELLIOT told Mr. Garro Jones on June 15 that his attention had not been drawn to complaints in various Dominion Government publications to the effect that their control over the sale of harmful or worthless drugs was hampered by the ineffective state of the law on this subject in Britain. In his consideration of measures to deal with this evil he would include the effective measures now in force in Canada, Australia, South Africa, and the United States of America.

Medical Examination of Militiamen

Replying on June 13 to Mr. Hepworth, Mr. ERNEST BROWN said the medical examination of militiamen would be conducted by a board consisting normally of five doctors, one of whom would act as chairman. Each of the four members would separately carry out certain specified parts of the examination, and would recommend the appropriate medical grade in respect of each part of the examination. The chairman would see each man stripped and would consider the recommendations, but would not re-examine each man unless there was a doubtful condition which might affect the grading. In such a case he would himself make an examination and consult with the members of the board.

Mr. DE LA BÈRE asked the Minister of Labour whether he would consider making an intensive examination of militiamen at one or two selected Army depots with a view to eliminating the nervously unstable youth who would be liable to suffer from shell-shock in the event of emergency. Mr. HORE-BELISHA, who replied, said in view of the fact that the medical examination carried out under Section 4 of the Military Training Act was designed to prevent men who were unfit for military training owing to nervous instability from entering the Militia, it was considered that a subsequent medical examination in this connexion was not necessary.

On June 19 Mr. LENNOX-BOYD, replying to Mr. Gordon Macdonald, said that the same standard of fitness was not applied in the medical tests of militiamen as in those of recruits for the Regular Forces. The examination for the Regular Forces had in view the needs of particular units, while that of militiamen was of a more general character.

Hutted Hospitals in North Wales

The building of huts for 200 beds as an extension of the North Wales Sanatorium, near Denbigh, is to begin immediately. Officers of the Ministry of Health are visiting sites in South Wales to select one which will meet the requirements of a complete hospital. Dr. Elliot is in communication with the local authorities with a view to attaching huts to an existing institution in a third Welsh district.

Advertisements in Books of Stamps.—Major TRYON told Sir Arnold Wilson on June 5 that the Ministry of Health was not consulted before the insertion in the books of postage stamps of the advertisement of a proprietary remedy for diseases of the bladder, kidney, prostate gland, and for rheumatism. The Ministry of Health was aware of the general policy of the Post Office regarding advertisements of proprietary remedies.

Rheumatism in School Children.—On June 15 Mr. KENNETH LINDSAY, replying to Mr. James Griffiths, said there did not appear to be any reliable statistical evidence of an increase in the incidence of rheumatism in school children either in England or in Wales. Owing to the difficulty of diagnosis the returns of school medical officers varied considerably from one area to another. The percentages of children with organic heart disease, which was in the main due to rheumatism, were higher in Wales than in England, but had remained practically stationary during the last four years. There was no evidence of an increase in mortality due to this cause. Following the pioneer example of Cardiff some other authorities in Wales provided special hospital schools for rheumatic children and supervisory rheumatic centres. Provision of this kind was desirable.

Notes in Brief

Medical Boards set up under the Military Training Act number 149. They will hold one or two sessions daily, each session lasting about two and a half hours, and about thirty men will normally be examined at each session.

The survey of housing conditions in rural Wales, which housing inspectors of the Ministry of Health are carrying out, is proceeding with expedition. Eleven districts have now been visited. Dr. Elliot has received two reports, and has communicated with the local authorities on points raised in these. The remaining reports will be ready very shortly.

Adult cripples, so far as their removal is feasible, are included among the priority classes for the purposes of the Government evacuation scheme.

The number of patients who, on April 1, 1939, were receiving treatment in residential institutions under the arrangements made by local authorities in England and Wales for the institutional treatment of tuberculosis was 27,676, and the number of persons who had been awaiting such treatment for more than ten days was 1,772.

Parishes in England and Wales without a piped water supply number 3,432: these parishes contain about one-eighth of the rural population. It is further estimated that 2,000 parishes with a piped water supply are without a public system of sewage disposal.

Medical News

The sixth Prosser White Annual Oration, on "Malignant Melanoma," arranged by the St. John's Hospital Dermatological Society, will be delivered by Professor G. Grey Turner at the Royal Society of Medicine, 1, Wimpole Street, W., on Wednesday, June 28, at 5 p.m.

Sir Laurence Brock, chairman of the Board of Control, will open the new admission hospital of the Three Counties Hospital, Arlesey, Bedfordshire, on Monday, June 26, at 3 p.m.

A preliminary announcement has now been made of the sixth Pacific Science Congress, which is to be held at Berkeley, Stanford, and San Francisco, California, from July 24 to August 12, 1939. Copies may be obtained from the secretary of the congress, 205, Hilgard Hall, University of California, Berkeley, California. Subjects to be considered include the various epidemiological diseases of the Pacific Basin, nutritional problems in the same area, industrial hygiene, with special reference to transportation, health education of school children and the general public, and the influence of barometric pressure on health.

Mr. Hugh Lett, President of the Royal College of Surgeons of England, will speak at the annual meeting of the Bearsted Memorial Hospital (Jewish Maternity Hospital Incorporated) at 1, Carlton Gardens, S.W., on Wednesday, June 28, at 4.30 p.m. Building operations have started for the new hospital at Stoke Newington, the total cost of which will amount to £96,000, towards which Viscount Bearsted recently contributed £30,000.

The first International Congress of Biology applied to Physical Education and to Sports will be held at Brussels from July 9 to 12, coinciding with the reunion of the International Association of "Sports-Physicians." Special attention will be given to the physiological aspects and the dietetics of physical training. Inquiries should be addressed to the secretary of this Congress, 96, Avenue Paul Janson, Brussels.

A meeting of the Association of Clinical Pathologists will be held at the Coventry Joint Laboratory, Stoney Stanton Road, Coventry, on Saturday, July 1, at 9.30 a.m., when the main subject for discussion will be "The Clinical Pathology of Tuberculosis."

The German Society for Industrial Accidents and Insurance Medicine will hold its annual meeting on July 7 and 8 at Kiel under the presidency of Professor A. W. Fischer.

Among the subjects to be discussed at the annual conference of the Society of Chemical Industry, to be held in Exeter at the University College of the South-West from July 10 to 15, will be the latest work on fungicides and insecticides, and cosmetics.

The fourth World Conference of Workers for Cripples, under the auspices of the International Society of Crippled Children and the Central Council for the Care of Cripples, will be held in London from July 16 to 22, 1939. Further information can be obtained from the secretary, 34, Eccleston Square, S.W.1.

The annual dinner of the Cambridge Graduates' Medical Club will be held at St. John's College, Cambridge, on Friday, July 7, at 7.45 p.m., preceded at 7.15 by the annual meeting. Sir Walter Langdon-Brown, president of the Club, will take the chair. Members wishing to attend should write to Dr. L. E. H. Whitby, 121, Harley Street, London, W.1.

The June issue of the *Archives de Médecine des Enfants* is devoted to the chemotherapy of microbial infection.

The journal hitherto known as the *Archiv für Verdauungskrankheiten* has changed its name to *Gastroenterologia—Journal International de Gastro-entérologie—International Journal of Gastro-enterology*, indicating that articles in French or English as well as in German will be acceptable. The publishers are the firm of S. Karger at Basle.

Lord Horder has been elected president of the National Society for the Prevention of Venereal Disease. He succeeds Sir Basil Peto, a founder-member and president since 1926.

An international exhibition of protection against air attack will be held at Brussels on July 8 to 29 at the same time as the second international salon of aeronautics. Further information can be obtained from La Ligue de Protection Aérienne, 182, Rue de la Loi, Brussels.

The report of Papworth Village Settlement for the year 1938 will be presented at the Park Lane Hotel, Piccadilly, W.1, on Tuesday, July 4, at 3.15 p.m. H.R.H. the Duke of Kent, K.G. (president of Papworth), will preside and the speakers will include Professor John Hilton, M.A., and Sir Pendrill Varrier-Jones, F.R.C.P., who will show and explain some new slides of Papworth.

The first annual report of the Royal Liverpool United Hospital, an amalgamation of the four principal hospitals of the city, shows a deficit of over £10,000. It is pointed out by the chairman, Mr. R. H. Armstrong, that if the hospital had not benefited by unrestricted legacies becoming available during the year the deficit would have reached £31,269.

EPIDEMIOLOGICAL NOTES

Infectious Diseases in England and Wales during May

In the five weeks ending June 3, 8,587 cases of scarlet fever, 3,807 cases of diphtheria, 3,930 cases of primary pneumonia, and 109 cases of enteric fever were notified in England and Wales. The notifications of scarlet fever, diphtheria, primary pneumonia, and enteric fever were 88 per cent., 82 per cent., 85 per cent., and 77 per cent. of the expected numbers (deduced from the median values of the corresponding weeks of the years 1930–8). With the exception of diphtheria in England and Wales and enteric fever, for which notifications have shown a slight rise since last week, the infectious diseases generally have declined. The outbreaks of paratyphoid fever in the Hawick area, Roxburghshire, Scotland, and in County Kerry, Eire, referred to in these columns last week, both appear to be on the wane. While there were 26 cases of paratyphoid fever in Hawick last week, this week the number has dropped to 15. Elsewhere in Scotland paratyphoid fever has been widely scattered in both towns and rural districts, Aberdeen and Ayr Counties having 5 cases each, Lanark County 3, and Kilmarnock Borough, Inverness County, and Glasgow Borough 1 case each. During the week there were also 4 cases of typhoid fever in Glasgow and 1 each in Lanark and Dumbarton Counties. To the 63 cases notified last week in the Dingle Rural District, County Kerry, must be added 27, 1 case of which occurred in Tralee, bringing the total to 90 for the week under review, of which 3 patients have died. In the following week only 2 additional cases have been reported; 5 other cases of typhoid fever were notified during the week, 1 each being in Cork County Borough, Dublin County Borough, Letterkenny, Kilmallock, and Nenagh.

Cholera in China

Recently reports indicate that the cholera epidemic is spreading in the delta of the Si-Kiang in South China. Up to May 15, 270 cases have been reported at Fatshan, twelve miles south-west of Canton, and in Hong Kong an average of nearly 20 cases have been reported in the last four weeks, the numbers being 9 (10), 10 (6), 16 (9), 27 (13), week ended June 10. At Macao, despite energetic measures to control the disease by vaccination, cases have increased owing to the importation of the disease by the influx of refugees. All new arrivals were vaccinated as well as persons leaving Macao for Hong Kong; it is estimated that as many as 50 per cent. of the population have been vaccinated. The first case of cholera at Shanghai during the year was recorded on June 7; last year it first appeared between May 15 and 21, and thereafter the disease was continually present in the Shanghai area until the beginning of December.

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INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 10, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930-8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	30	9	14	2	—	20	4	8	2	3		
Deaths		1	3				1	2				
Diphtheria	755	90	153	40	25	912	113	159	39	26	896	151
Deaths	17	2	—	4	1	23	4	1	—	—		
Dysentery	24	5	22	1	—	32	13	81		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	1	—	—		—	4	—	—	1	—		
Deaths		—					3					
Enteric (typhoid and paratyphoid) fever	34	2	37	32	1	30	2	3	1	1	29	
Deaths	1	—	—	1	1	1	—	—	—	—		
Erysipelas			51	7	4			68	6	1		
Deaths		—					—					
Infective enteritis or diarrhoea under 2 years	39	14	6	5	2	43	12	11	4	2		
Deaths												
Measles		31	127		5			309		6*		
Deaths	3	1	—	3	—	12	—	4	—	—		
Ophthalmia neonatorum	115	13	25		1	91	6	45		—		
Deaths												
Pneumonia, influenzal†	743	61	3	1	13	801	63	11	1	17	805	63
Deaths (from influenza)	17	1	—	—	—	30	6	3	—	—		
Pneumonia, primary			190	10				210	6			
Deaths		9		15	8		18		15	15		
Polio-encephalitis, acute	1	—										
Deaths							—					
Poliomyelitis, acute	2	—	—	1	1	5	—	1		—		
Deaths		—					—					
Puerperal fever	3‡	3	9		1	—	—	17	4	2		
Deaths		4					1§					
Puerperal pyrexia	206	21	27		—	160	18	27		5		
Deaths												
Relapsing fever	—	—			—	—	—			—		
Deaths												
Scarlet fever	1,321	144	199	45	79	1,743	149	420	74	66	1,656	217
Deaths	2	1	1	1	—	4	—	—	1	—		
Small-pox	—	—	—	—	—	1	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		355	152		20			56		17		
Deaths	16	—	4	—	—	11	—	1	2	2		
Deaths (0-1 year)	278	49	62	16	15	307	46	77	18	22		
Infant mortality rate (per 1,000 live births)	44	43				51	38					
Deaths (excluding stillbirths)	4,438	782	570	198	152	4,321	827	633	152	135		
Annual death rate (per 1,000 persons living)	10.9	10.0	11.5	13.3	13.4	10.6	10.5	12.9	10.3	12.0		
Live births	7,189	1,192	1,001	334	264	6,262	1,202	948	296	240		
Annual rate per 1,000 persons living	17.6	15.3	20.3	22.5	23.2	15.4	15.3	19.3	20.0	21.3		
Stillbirths	243	42	42			278	45					
Rate per 1,000 total births (including stillborn)	33	34	40			43	36					

* 4 cases in Belfast alone.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

§ Deaths from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Eireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin.)

QUERIES AND ANSWERS

Adamantinoma and Multilocular Cysts

Mr. H. T. ROPER-HALL (43a, Calthorpe Road, Five Ways, Birmingham) would be grateful to readers who can send him case histories, slides, radiographs, and references to the literature relating to adamantinoma and multilocular cysts of the jaws and elsewhere. Everything will be well cared for and safely returned.

Mastitis in an Elderly Man

"G. A. T." writes: I have a retired clergyman aged 76 who suffers from a peculiar and recurrent form of mastitis. In the spring of 1937 he was seized by an inflammation of both breasts round the nipples; no retraction, but simple tenderness to the touch. This disappeared during the summer. The following year in spring it reappeared on the right breast again, disappearing in the summer. This year it has again appeared in the left mamma. His Reverence is a highly rheumatic subject. I would be obliged if some of your readers could give any light on the aetiology and treatment.

Thrombo-angiitis Obliterans

Sir HAROLD FAWCUS (London) writes: I was interested to read the request of Dr. X. (Belfast) for suggestions for the treatment of thrombo-angiitis obliterans in the *Journal* of June 10 (p. 1215). I have suffered from that condition for many years, and after trying many remedies without success I have educated myself to control my walking so as to cause the least pain. On grass I can walk the full round of a golf course without pain. On hard roads I can walk slowly for considerable distances with occasional halts, which become more frequent uphill. Walking on pavements is of course the very devil, especially uphill, and the only remedy is not to do it. A walking-stick or stout umbrella is essential at all times. A putter is useful on the golf course, and takes the place of a walking-stick.

Income Tax

Expenses of Postgraduate Study

"REFRESHER" asks: Am I entitled to claim as professional expenses expenditure incurred in connexion with postgraduate study?

*** The Board of Inland Revenue has expressed the opinion that it considers expenditure on refresher courses would normally be inadmissible in the case of assessments under Schedule E, but in the case of Schedule D assessments it would raise no objection to allowance of the cost of attending refresher courses as distinguished from expenditure in connexion with postgraduate study for a higher degree or diploma.

Changes in Practice

"ALPHA" had a practice at A and a branch practice at B; on October 1, 1937, he acquired a second practice at B, and on April 1, 1939, sold his practice at A, and has since carried on the combined practices at B. The inspector of taxes increased his assessment by £300 per annum as from October, 1937, but is leaving the receipts from the practice at A to fall out of the accounts in the ordinary way. As a result he will be charged for 1939–40 and for 1940–1 on amounts which will certainly exceed his earnings.

*** Presumably the purchaser of the practice at A will be assessed as from April 1, 1939, and there is undoubtedly some inequity in continuing to have regard to "A" receipts in assessing him for 1939–40 onwards. The legal position is, however, governed by dicta in the case of Stockham *v.* Wallasey U.D.C., to the effect that "succession" does not apply to part of a business. On that basis "Alpha" would be debarred from saying that he was entitled to exclude "A" receipts from his income tax return. The only hope there appears to be of redress would be to show that the practice at B was so independently worked that in substance A and B were separate practices, and that there has been a legal succession as regards A. Where the equity is so clearly in favour of the taxpayer the Commissioners might reasonably be expected to find in his favour if the facts could be so construed.

LETTERS, NOTES, ETC.

Birthday Honours: Addendum

To the list of members of the medical profession included in the Birthday Honours, published last week at page 1247, should be added the name of Mrs. Cornelia Bonté Sheldon Elgood, O.B.E., M.B., a British subject resident in Cairo, who is promoted to be C.B.E. (Civil Division).

Mumps Complicating Chronic Pancreatitis?

Dr. P. L. DESHMUKH (Poona City) writes: I refer to Dr. A. Wilson Russell's report of a case of "mumps as a possible complication of chronic pancreatitis" (*Journal*, April 15, p. 774). The circumstances lead one to believe that the case was one of carcinoma of the bile duct ending fatally as acute parotitis, resulting possibly from an unclean or septic condition of the mouth. The facts from the history that warrant such a conclusion are the age of the patient (77), the presence of stomatitis, the injection of the orifices of Stenson's ducts, and the development of parotitis just a day or two before death. Though mumps is a parotitis, all conditions of parotid inflammation cannot be called mumps. Mumps is believed to be a specific virus infection with which there may be a variety of neurological and other complications. The parotitis in the above case is possibly due to infection from the mouth ascending along Stenson's duct. Thus, the effort of the author to show mumps as a possible complication of chronic pancreatitis appears to me to be rather misleading.

Medical Golf

Fifty members of the Medical Golfing Society held a most enjoyable meeting at Bramshot Fleet on June 8, when the competitions resulted as follows: *Lancet* Cup (scratch), E Canton Sewart, after a tie with A. H. Knowles and J. Benson Young. Henry Morris Cup (handicap), Leslie Hartley, after a tie with Drs. Seward, Elliott Blake, J. Grant, and Norman Daniels. Gordon-Watson Cup (Veterans), Sir Stanley Hewett. Class I.—First prize, E. Canton Seward after a tie with Elliott Blake and J. Grant. Second prize, Elliott Blake. Best last nine, D. Anthony. Class II.—First prize, Leslie Hartley. Second prize, Norman Daniels. Best last nine, Sir Stanley Hewett.

Disclaimer

Mr. A. DICKSON WRIGHT writes: My name was used in the *Evening Standard* of June 10, without my knowledge or consent, with reference to the treatment of phlebitis. I would be grateful for the courtesy of your columns in making this fact known.

Correction

Two errors occurred in the typescript of the report of the meeting of the Royal Society of Tropical Medicine and Hygiene published on June 10, p. 1196, column 2. Professor R. M. Gordon's reference in line 7 was to the Gambia, not to the Congo, and in line 15 to *G. palpalis*, not to *G. pallidipes*.